Vol. 1063 Number 4

OFFICIAL GAZETTE

of the

UNITED STATES PATENT AND TRADEMARK OFFICE

Route to:

PATENTS

February 25, 1986

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DEPARTMENT
OF COMMERCE

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The following are mailed under direction of the Superintendent of Documents, Government Printing Office, Washington, D.C., 20402, to whom all subscriptions should be made payable and all communications addressed:

THE OFFICIAL GAZETTE (PATENT SECTION), issued weekly.
THE OFFICIAL GAZETTE (TRADEMARK SECTION), issued weekly.
GENERAL INFORMATION concerning PATENTS.
GENERAL INFORMATION concerning TRADEMARKS.

COPIES OF PATENTS are furnished by the Patent and Trademark Office at $1.50 each; PLANT PATENTS in color, $6.00 each; copies of TRADEMARKS at $1.00 each. Address orders to the Commissioner of Patents and Trademarks, Washington, D.C., 20231.

Printing authorized by Section 11(a)3 of Title 35, U.S. Code P.T.O.

PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning the PCT member countries see the notice appearing in the *Official Gazette* at 1052 O.G. 52 on Mar. 26, 1985.

For use of the European Patent Office as Searching Authority for PCT applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52 on Sept. 28, 1982.

Certain domestic fees for international applications have been changed effective Oct. 5, 1985 in the rule change notice titled "Revision of Patent Fees" published at 1057 O.G. 24 on Aug. 20, 1985.

The Search fee of the European Patent Office has been changed as of Feb. 9, 1986 and is announced in the *Official Gazette* at 1061 O.G. 30 on Dec. 31, 1985.

International PCT fees have been changed effective Jan. 1, 1986 and were announced in the *PCT Gazette* on Oct. 24, 1985 and in the *Official Gazette* at 1061 O.G. 30 on Dec. 31, 1985.

The current schedule of PCT fees is as follows:

Transmittal fee:	170.00
Search Fee	
U.S. Patent and Trademark Office as Searching Authority	
—No corresponding prior U.S. national application filed	420.00
—Corresponding prior U.S. national application filed	250.00
European Patent Office as Searching Authority	
if paid before Feb. 9, 1986	750.00
if paid on or after Feb. 9, 1986	830.00
International fees	
Basic fee (first 30 pages):	
if paid before Jan. 1, 1986	280.00
if paid on or after Jan. 1, 1986	325.00
Basic Supplemental fee (for each page over 30):	
if paid before Jan. 1, 1986	6.00
if paid on or after Jan. 1, 1986	6.00
Designation fee for the first 10 national or regional offices:	
if paid before Jan. 1, 1986	70.00
if paid on or after Jan. 1, 1986	80.00
Designation fee for 11th and subsequent designations	No charge

DONALD J. QUIGG,
Dec. 17, 1985. *Assistant Secretary and Commissioner of Patents and Trademarks.*

Notice of Maintenance Fees Payable

Title 37, Code of Federal Regulations, Section 1.362(d), effective Nov. 1, 1984, provides that maintenance fees may be paid without surcharge for a six-month period beginning 3, 7, and 11 years after the date of issue of patents based on applications filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(k) or (l), as amended effective Oct. 5, 1985. If the maintenance fee is not paid in a patent requiring such payment, the patent will expire on the 4th, 8th or 12th anniversary of the grant.

Attention is drawn to the patents which were issued on Feb. 22, 1983, for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,374,439 through 4,375,106
Reissue Patents based on the above identified patents.

No maintenance fees are required for design or plant patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

The current amounts of the maintenance fees due at 3 years and six months are set forth in 37 CFR 1.20(e) and (h), as amended effective Oct. 5, 1985, which are reproduced below:

37 CFR §1.20 Post-issuance fees

"(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant . . . $ 225.00"

"(h) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant:
By a small entity (§1.9(f)) . . . . . $ 225.00
By other than a small entity . . . . . $ 450.00"

The amounts of the surcharges, as amended effective Oct. 5, 1985, are set forth in 37 CFR 1.20 (k) and (l) which are reproduced below:

"(k) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982 . . . . . $ 110.00"

"(l) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Aug. 27, 1982:
By a small entity (§1.9(f)) . . . . . $ 55.00
By other than a small entity . . . . . $ 110.00"

Section 1.20 paragraph (m) as amended as a result of enactment of Public Law 98-622 effective Nov. 8, 1984, is reproduced below:

"(m) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay in payment is shown to the satisfaction of the Commissioner to have been unavoidable . . . . . $ 500.00"

Notice of Expiration of Patents Due to Failure to Pay Maintenance Fees

35 U.S.C. 41 and 37 CFR 1.362(g) provide that if the required maintenance fee and any applicable surcharge are not paid in a patent requiring such payment, the pa-

tent will expire at the end of the 4th, 8th, or 12th anniversary of the grant of the patent depending on the first maintenance fee which was not paid.

According to the records of the Office, the patents listed below have expired due to failure to pay the required maintenance fee and any applicable surcharge.

PATENTS WHICH EXPIRED DECEMBER 8, 1985 DUE TO FAILURE TO PAY MAINTENANCE FEES

Patent Number	Serial Number	Issue Date
4,304,277	06/231,337	12/8/81
4,304,355	06/229,725	12/8/81
4,304,663	06/225,597	12/8/81
4,304,719	06/228,013	12/8/81

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.19(a)).

4,419,756, Re. S.N. 806,266, Filed Dec. 6, 1985, Cl. 375/007, VOICEBAND DATA SET, Enrique Cheng-Quispe, et al., Owner of Record: *Bell Telephone Laboratories, Inc., Murray Hill, N.J.,* Attorney or Agent: Roy C. Lipton, Ex. Gp.: 263

4,424,787, Re. S.N. 809,153, Filed Dec. 16, 1985, Cl. 123/549, ENCAPSULATED PTC HEATER FOR COLD-START CARBURETOR, Edward J. Fitz, Owner of Record: *Casco Products Corp., Bridgeport, Conn.,* Attorney or Agent: Mitchell D. Bittman, Ex. Gp.: 342

4,462,720, Re. S.N. 791,539, Filed Oct. 25, 1985, Cl. 406/84, AIR TABLE SYSTEM, Ronald A. Lenhart, Owner of Record: *Precision Metal Fabricators, Inc., Lakewood, Colo.,* Attorney or Agent: Gary D. Fields, et al., Ex. Gp.: 313

4,495,917, Re. S.N. 811,019, Filed Dec. 18, 1985, Cl. 128/419R, SURGICALLY IMPLANTABLE DISCONNECT DEVICE, Charles L. Byers, Owner of Record: *Regents of the University of Calif., Berkeley, Calif.,* Attorney or Agent: Paul S. Lempio, Ex. Gp.: 335

4,502,467, Re. S.N. 814,449, Filed Dec. 30, 1985, Cl. 126/429, COMPACT ATTIC MOUNTED SOLAR HEATING PACK ASSEMBLY, David C. Smith, Owner of Record: *Robert Weeks, J. A. Porter, et al., Huntington, W. Va.,* Attorney or Agent: Richard C. Sughrue, et al., Ex. Gp.: 345

4,511,068, Re. S.N. 814,653, Filed Dec. 30, 1985, Cl. 222/257, DISPENSER FOR PASTE-LIKE PRODUCTS, Japp Bossina, Owner of Record: *Gap Geselschaft Fur Auswertungen und Patente AG, Glarus, Switzerland,* Attorney or Agent: James E. Nilles, et al., Ex. Gp.: 311

4,531,660, Re. S.N. 812,672, Filed Dec. 23, 1985, Cl. 222/209, FOAM DISPENSING DEVICE, George W. Ford, Jr., Owner of Record: *Hershel Earl Wright, Decatur, Ill.,* Attorney or Agent: Lynn G. Foster, Ex. Gp.: 311

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19(a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

3,343,506, Reexam. No. 90/000,924, Requested: Dec. 16, 1985, Cl. 108/107, FOUR POST SHELVING WITH INSERTABLE SHELVES, Henry M. Bucbinder, Owner of Record: *Ardco, Inc., Chicago, Ill.,* Attorney or Agent: Lidig, Voit, et al., Ex. Gp.: 350, Requester: Commercial Refrigerator Door, Inc., Sarasota, Fla.

3,611,549, Reexam. No. 90/000,929, Requested: Dec. 31, 1985, Cl. 29/423, METHOD FOR FORMING HOLES IN AND INSTALLING LINES IN STRUCTURAL MEMBERS, George F. Pope, Owner of Record: *Scoggins Mfg., Inc., Graham, N.C.,* Attorney or Agent: Bruce M. Collins, Ex. Gp.: 320, Requester: Lerner, David, et al., Westfield, N.J.

3,697,188, Reexam. No. 90/000,930, Requested: Dec. 31, 1985, Cl. 408/230, APPARATUS FOR FORMING HOLES IN AND INSTALLING LINES IN STRUCTURAL MEMBERS, George F. Pope, Owner of Record: *Scoggins Mfg., Inc., Graham, N.C.,* Attorney or Agent: Bruce M. Collins, Ex. Gp.: 320, Requester: Lerner, David, et al., Westfield, N.J.

3,815,531, Reexam. No. 90/000,925, Requested: Dec. 16, 1985, Cl. 112/220, SEWING MACHINE EQUIPPED WITH PULSE GENERATOR, John Wurst, et al., Owner of Record: *Singer Co., New York, N.Y.,* Attorney or Agent: M. J. Breen, Ex. Gp.: 240, Requester: Husqvarna Aktiebolag, Husakarna, Sweden

3,848,600, Reexam. No. 90/000,922, Requested: Dec. 11, 1985, Cl. 128/303.13, INDIFFERENT ELECTRODE IN ELECTROSURGICAL PROCEDURES AND METHOD OF USE, Charles Patrick, et al., Owner of Record: *NDM Corp., Dayton, Ohio,* Attorney or Agent: Killworth, Gottman, et al., Ex. Gp.: 330, Requester: Owner

3,854,655, Reexam. No. 90/000,923, Requested: Dec. 13, 1985, Cl. 232/4R, CONTAINERS FOR BANKNOTES AND THE LIKE, John H. G. Armstrong, Owner of Record: *Inventor, Freshfield, England,* Attorney or Agent: Scrivener, Parker, et al., Ex. Gp.: 330, Requester: Sandler & Greenblum, Arlington, Va.

3,909,508, Reexam. No. 90/000,928, Requested: Dec. 26, 1985, Cl. 174/117M, WOVEN ELECTRICALLY CONDUCTIVE CABLE AND METHOD, Edgar A. Ross, Owner of Record: *Woven Electronics Corp., Greenville, S.C.,* Attorney or Agent: Curtis, Morris, et al., Ex. Gp.: 210, Requester: Owner

4,314,897, Reexam. No. 90/000,931, Requested: Jan. 6, 1986, Cl. 204/299, ELECTOPHORESIS GEL CONTAINER, Charles S. Monte, et al., Owner of Record: *Beckman Instruments, Inc., Fullerton, Calif.,* Attorney or Agent: R. J. Steinmeyer, Ex. Gp.: 110, Requester: Owner

4,479,380, Reexam. No. 90/000,926, Requested: Dec. 18, 1985, Cl. 73/61.1, OPEN-TUBULAR SUPERCRITICAL FLUID CHROMATOGRAPHY, Milo Novotny, et al., Owner of Record: *Brigham Young University, Provo, Utah,* Attorney or Agent: Pennie & Edmonds, Ex. Gp.: 260, Requester: Owner

4,490,148, Reexam. No. 90/000,927, Requested: Dec. 20, 1985, Cl. 604/385, PROTECTOR AGAINST INCONTINENCE OR DIAPER, Bo Beckestrom, Owner of Record: *Landstingenes Inkopscentral, Solna, Sweden,* Attorney or Agent: Young & Thompson, Ex. Gp.: 330, Requester: Proctor & Gamble Co., Cincinnati, Ohio

Registation to Practice

The following list contains the names of persons applying for registration to practice before the United States Patent and Trademark Office. These persons have been given provisional recognition pursuant to 37 CFR 10.9(a) to prepare and prosecute patent applications before the Office. Final approval for registration is subject to establishing to the satisfaction of the Director of the Office of Enrollment and Discipline that the person seeking registration is of good moral character and repute. [37CFR 10.7(a)]. Accordingly, any information tending to affect the eligibility of any of the following applicants on moral, ethical, or other grounds should be furnished the Director, Office of Enrollment and Discipline on or before Apr. 4, 1986:

Conrad, Robert A., 2010 Sandhill Ct., Indianapolis, Ind. 46217
Hobbs, George D. II, 1809 Shipley Rd., Wilmington, Del. 19803
Schiavelli, Alan E., 819 S. 18th St., #308, Arlington, Va. 22202
Sheridan, Robert G., 8605 Pepperdine Dr., Vienna, Va. 22180
Smith, Charles E., 1229 Mendoza Dr., St. Peters, Mo. 63376
Tollberg, Stanley H., 203 Yoakum Pkwy., Alexandria, Va. 22304
Trapani, Lawrence P., 1109 Taylor Ave., Utica, N.Y. 13501

CAMERON WEIFFENBACH,
Jan. 28, 1986. *Director, Office of Enrollment and Discipline.*

XEROX LICENSE OFFER

This notice is published pursuant to a CONSENT ORDER TO CEASE AND DESIST dated July 29, 1975, as modified Sept. 10, 1982, between Xerox Corp. and the Federal Trade Commission.

TERMS *contained in this notice are defined in the Consent Order. All interested parties should refer to that document for the definitions and additional details of Xerox's patent and know-how licensing obligations thereunder.* A copy of the Consent Order and a list of PATENTS licensed to Xerox which are subject to the provisions of paragraphs II and IV (C) (9) of the Order, if any, are available from Xerox upon written request. All such requests and any request relating to the licensing of PATENTS pursuant to the Consent Order should be made in writing and addressed to:

The Manager of Patent Licensing
Xerox Corp.
P.O. Box 1600
Stamford, Conn. 06904

Xerox shall, in accordance with the terms of the Consent Order, grant licenses under

(a) its ORDER PATENTS to make, have made, use and vend OFFICE COPIER PRODUCTS under the terms of the Consent Order; and

(b) patents which are required to be licensed pursuant to the terms of paragraph X of the Consent Order, if any.

The following is a list of patents which is believed to include all of the PATENTS available for licensing in accordance with the terms of the Consent Order issued since the publication of the last notice by Xerox (1053 OG 44). A copy of the classification index for the listed patents also appears at 1012 OG–55. Since the classification system is not restricted solely to OFFICE COPIER PRODUCTS, there are several patents included in the list to which the Consent Order is not applicable.

XEROX PATENTS

CLASS: 01A01A
COATING METHOD TO IMPROVE ADHESION OF PHOTOCONDUCTOR. May 15, 1985. GER 2,521,518.

CLASS: 01A01B
COATING METHOD TO IMPROVE ADHESION OF PHOTOCONDUCTOR. May 15, 1985. GER 2,521,518.

CLASS: 01A02
OVERCOATED INORGANIC LAYERED PHOTORESPONSIVE DEVICE AND PROCESS OF PREPARATION. Sept. 12, 1984. GRB 2,070,797.

CLASS: 01A04
ELECTROPHOTOGRAPHIC IMAGING METHOD. Sept. 3, 1984. FRA 7,833,600.

CLASS: 01A06
LAYERED IMAGING MEMBER AND METHOD. Oct. 25, 1984. GER 2,108,938.

CLASS 01B01
LIGHTWEIGHT ELECTROPHOTOGRAPHIC COPY PAPER. Sept. 27, 1984. GER 2,132,017.

CLASS: 01B04A
ELECTROSTATOGRAPHIC METHOD & APPARATUS. Apr. 12, 1985. JAP 1,260,501.

CLASS: 01D
DUPLEXING XEROGRAPHIC REPRODUCING MACHINE WITH COPY SHEET REVERSING STATION. May 15, 1985. GER 1,940,284. Oct. 16, 1984. HOL 168,062.
DUPLEX COPYING SYSTEM. Sept. 6, 1984. GER 2,366,431.

CLASS: 01E
IMAGING METHOD. May 27, 1985. JAP 1,266,682.

CLASS: 01J01
NOVEL IMAGING SYSTEM. May 13, 1985. FRA 2,388,313.

CLASS: 02A
REPRODUCTION MACHINE FUSER. June 4, 1985. HOL 176,983.
COATING METHOD TO IMPROVE ADHESION OF PHOTOCONDUCTOR. May 15, 1985. GER 2,521,518.

CLASS: 02A01B
IMAGING SYSTEM. Nov. 13, 1984. JAP 1,239,239.

CLASS: 02A02
LAYERED IMAGING MEMBER AND METHOD. Oct. 25, 1984. GER 2,108,938.
DRIVE SYSTEM FOR MULTI-MODE REPRODUCING APPARATUS. Mar. 21, 1985. ITL 1,068,103.

CLASS 02B
IMAGING SYSTEM. Nov. 13, 1984. JAP 1,239,239.
IMAGING SYSTEM. Oct. 17, 1984. JAP 1,235,533.

CLASS: 02E
COATING METHOD TO IMPROVE ADHESION OF PHOTOCONDUCTOR. May 15, 1985. GER 2,521,518.

CLASS: 03C
BIASING ARRANGEMENT FOR CORONA DISCHARGE DEVICE. Nov. 26, 1984. JAP 1,240,989.

CLASS: 03C01

CORONA CHARGING DEVICE. Mar. 16, 1985. ITL 1,067,490.

CLASS: 04B01A

IMAGE TRANSMITTING SYSTEM UTILIZING A GRADIENT INDEX LENS. Jan. 14, 1985. MEX 151,620.

CLASS: 04B06

VARIABLE MAGNIFICATION REPRODUCING APPARATUS. July 11, 1985. JAP 1,271,756.

CLASS: 05C01

SELF-AGITATED DEVELOPMENT PROCESS. Jan. 30, 1985. ATR 41,399. Jan. 30, 1985. BEL 41,399. Jan. 30, 1985. FRA 41,399. Jan. 30, 1985. GER P31,685,986. Jan. 30, 1985. GRB 41,399. Jan. 30, 1985. HOL 41,399. Jan. 30, 1985. STZ 41,399.

CLASS: 05E

IMAGING SYSTEMS — SLTC INKS WITH BREAK-IN ADDITIVES. Apr. 18, 1985. GER 2,032,652

CLASS: 05N01B

IMAGING SYSTEM. Apr. 25, 1985. GER 2,032,393.

IMAGING MATERIALS. Apr. 25, 1985. JAP 1,261,227.

CLASS: 05N02A

CLASSIFIED TONER MATERIALS. Oct. 17, 1984. JAP 1,234,902.

CLASS: 05N02A01

IMAGING MATERIALS. Apr. 25, 1985. JAP 1,261,227.

CLASS: 05N02B

CLASSIFIED TONER MATERIALS. Oct. 17, 1984. JAP 1,234,902.

CLASS: 05N04

CLASSIFIED TONER MATERIALS. Oct. 17, 1984. JAP 1,234,902.

CLASS: 05N05

FLEXTROSTATOGRAPHIC PRESSUREFIXABLE TONER COMPOSITION. Apr. 25, 1985. JAP 1,261,212.

CLASS: 06B10A

SHEET SEPARATOR. Jan. 23, 1985. BEL 27,045. Jan. 23, 1985. FRA 27,045. Jan. 23, 1985. GER P30,700,253. Jan. 23, 1985. GRB 27,045. Jan. 23, 1985. HOL 27,045. Jan. 23, 1985. ITL 27,045.

CLASS: 06K

SORTER WITH SHEET STRIPPING PINS. Oct. 18, 1984. GER P2,628,909. Oct. 17, 1984. JAP 1,235,143.

COMPACT SORTING APPARATUS. Oct. 17, 1984. JAP 1,235,657.

VERY HIGH SPEED DUPLICATOR WITH FINISHING FUNCTION. July 23, 1985. CAN 1,190,886.

VERY HIGH SPEED DUPLICATOR WITH FINISHING FUNCTION. July 23, 1985. CAN 1,190,887.

CLASS: 08A

REPRODUCTION MACHINE FUSER. June 4, 1985. HOL 176,983.

METAL-FILLED ELASTOMER FUSER MEMBER. Aug. 1, 1984. BEL 18,140. Aug. 1, 1984. FRA 18,140. Aug. 1, 1984. GER P30,687,684. Aug. 1, 1984. GRB 18,140.

CLASS: 08A02

CARBOXY FUNCTIONAL POLYORGANOSILOXANE RELEASE AGENTS FOR FUNCTIONAL TONER. Sept. 26, 1984. JAP 1,231,883.

CLASS: 08E

FLEXTROSTATOGRAPHIC PRESSUREFIXABLE TONER COMPOSITION. Apr. 25, 1985. JAP 1,261,212.

CLASS: 09A02A

CLEANING OF RESIDUAL TONER FROM ELECTROSTATOGRAPHIC SURFACE-USE OF FLICKER BAR MATERIAL FOR ELECTROSTATIC CHARGING. July 11, 1985. GER 2,201,784.

CLASS: 10

FLUIDIC FEEDING OF DOCUMENT TO AN EXPOSURE STATION. June 10, 1985. JAP 1,268,300.

CLASS: 10A

PRE-COLLATION COPYING. Dec. 14, 1984. JAP 1,244,051.

DRIVE SYSTEM FOR MULTI-MODE REPRODUCING APPARATUS. Mar. 21, 1985. ITL 1,068,103.

FLUIDIC FEEDING IN DOCUMENT TO AN EXPOSURE STATION. June 10, 1985. JAP 1,268,300.

COUNTER BALANCE MECHANISM. Sept. 26, 1984. GRB 2,090,670.

BOTTOM SHEET SEPARATOR-FEEDER. June 26, 1985. GRB 2,109,352.

CLASS 10F

DUPLEX COPYING SYSTEM. Sept. 6, 1984. GER 2,366,431.

CLASS: 10H

PRE-COLLATION COPYING. Dec. 14, 1984. JAP 1,244,051.

CLASS: 17B02

IMAGE TRANSMITTING SYSTEM UTILIZING A GRADIENT INDEX LENS. Jan. 14, 1985. MEX 151,620.

CLASS: 17E01

FLYING SPOT SCANNER. Sept. 13, 1984. GER 2,365,916.

SCANNING APPARATUS. July 30, 1984. FRA 7,812,989.

REPRODUCTION SCANNING SYSTEM HAVING INTERMEDIATE STORAGE BETWEEN INPUT AND OUTPUT SCANNING STATION. June 17, 1985. FRA 7,806,849. July 26, 1985. ITL 1,093,657.

DOUBLE PASS OPTICAL SYSTEM FOR RASTER. Dec. 18, 1984. CAN 1,179,536.

DOUBLE PASS SCANNING SYSTEM. Dec. 18, 1984. CAN 1,179,537.

CLASS: 18C01B

IMAGING SYSTEM. Apr. 25, 1985. GER 2,032,393.

CLASS: 18C02A

CLASSIFIED TONER MATERIALS. Oct. 17, 1984. JAP 1,234,902.

CLASS: 18C02B

CLASSIFIED TONER MATERIALS. Oct. 17, 1984. JAP 1,234,902.

CLASS: 18C04

CLASSIFIED TONER MATERIALS. Oct. 17, 1984. JAP 1,234,902.

CLASS: 18C05

DEVELOPER COMPOSITIONS CONTAINING ALKYL PYRIDINIUM TOLUENE SULFONATES. June 26, 1985. GRB 2,111,711.

CLASS: 20A06

DRIVE SYSTEM FOR MULTI-MODE REPRODUCING APPARATUS. Mar. 21, 1985. ITL 1,068,103.

CLASS: 20B02

BELT TRACKING SYSTEM. July 19, 1985. HOL 177,255.

CLASS: 20C

BELT TRACKING SYSTEM. July 19, 1985. HOL 177,255.

CLASS: 21C

METHOD AND APPARATUS FOR PRETREATING AND DEPOSITING THIN FILMS ON SUBSTRATES. Dec. 19, 1984. GER P30,698,158. Dec. 19, 1984. GRB 17,360. Dec. 19, 1984. STZ 17,360. Dec. 19, 1984. SWD 17,360.

Status of PTO Services

The following is an update of the status of PTO services for January 1986:

Service Item	FY 1985 Goal (Calendar Days)	FY 1986 Goal (Calendar Days)	Monthly Average (Calendar Days)
Filing Receipts:			
Patents	22	22	37
Trademarks	30	30	36
Patent/Trademark Copies:			
Special Window Coupons	1	1	95% within 1 day
Window Coupons	5	5	99% within 5 days
Mail Coupons	29	26	99% within 26 days
Letter Orders	34	26	99% within 26 days
Date of oldest unfilled order			Jan. 27, 1986
Current Mail Date being processed			Jan. 31, 1986
Certified Copies:			
Trademark Registrations	30	30	23
Applications-As-Filed	20	10	67% within 7 days*
File-Wrapper/Contents	N/A	N/A	88% within 7 days
Walk-up Certification	1	1	75% within 24 hours
Trademark Search Library:			
Filing Pending Marks	21	21	30
Filing Reg. Certificates	3	Issue Date	7 Days Late**
Assignments:			
Patents	25	20	18
Trademarks	25	20	20
Avg. Days from Issue Fee Payment to Issue Date	90–100	90–100	112***
Issue Fee Receipts Mailed	4 weeks prior to Issue Date	4 weeks prior to Issue Date	On schedule
Patent Copies Available	Issue Date	Issue Date	99% on Issue Date
Trademark Copies Available	Issue Date	Issue Date	99% on Issue Date

*Equipment and supply problems.
**Delay due to late deliveries from printing contractor.
***This period has increased temporarily because an abnormally high number of payments were received prior to Oct. 5, 1985 to avoid higher fees. It should return to its previous level within the next few months.

IMPROVEMENTS IN SERVICES

- *Electronic Copy Ordering Update* — We have completed our research into the electronic and telephone ordering methods referred to in our Official Gazette Notice of Dec. 31, 1985, and have decided to implement the electronic ordering service. This service should be available to domestic deposit account customers by Apr. 1986. Specific information will be issued directly to deposit account customers.

  If you want to receive information on the electronic ordering service, please send your name, complete address, and deposit account number to: Mary Brown, Office of Patent and Trademark Services, U.S. Patent and Trademark Office, Washington, D.C. 20231.

HELPFUL HINTS FROM THE PTO

- *Notices of Appeal to the United States Court of Appeals for the Federal Circuit* — Notices of appeal to the United States Court of Appeals for the Federal Circuit should be sent to the Solicitor at the address below:

Solicitor
Box 8
U.S. Patent and Trademark Office
Washington, D.C. 20231

Improperly addressing such communications, e.g. to the examining group, may delay delivery to the Solicitor.

ORGANIZATION DIRECTORY

- *Telephone Directory* — The Office has recently updated its in-house organizational telephone directory. The directory reflects the most recent office moves, changes in personnel and new telephone numbers. For your convenience and future reference, the directory is reprinted in this issue.

Feb. 4, 1986.

THERESA A. BRELSFORD,
Assistant Commissioner
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111 Metallurgy - alloys, process and apparatus; metal stock L. Dewayne Rutledge rm 10E02 CP3..... 557-6722

112 Electro-chemical John F. Niebling rm 9B26 CP3..... 557-1217

113 Inorganic compounds and non-metallic elements (except radioactive); chemical gas purification processes; beneficiating ores; hydrometullurgy; magnetic and piezoelectric compositions John Doll rm 9A15 CP3..... 557-2517

114 Methods for semiconductor treating and manufacturing; batteries; photovoltaic cells and their methods of operation Brian E. Hearn rm 10D35 CP3..... 557-6728

116 Mineral oil processes and products, catalytic compositions and chemistry of hydrocarbon Andrew H. Metz rm 9D35 CP3..... 557-3029

118 Liquid and solid fuels, chemical and biological fertilizers, refractory and pigment compositions, lubricating compositions William R. Dixon, Jr. rm 9E06 CP3..... 557-6698

120 Organic Chemistry and Biotechnology rm 9C13 CP2..... 557-3920
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121 Heterocyclic organic chemistry Henry R. Jiles rm 9D01 CP2..... 557-3920

122 Nitrogen containing heterocyclic compounds, mercaptans and carbonate esters Donald G. Daus rm 8B32 CP2..... 557-3920

123 Peptides, carbohydrates, aromatic nitriles hetero-O and -S containing compounds, cosmetics, dentifrices, drug and pesticide carriers, and viral immunology Donald B. Moyer rm 8A15 CP2..... 557-3920

124 Nitrogen, heavy metal, silicon, halogen, acid/ester organic compounds Charles F. Warren rm 8D31 CP2..... 557-3920

125 Medicines, poisons, cosmetics, testing compositions, and molecular biology Albert T. Meyers rm 8B02 CP2..... 557-3920

126 Organic carboxylic acid and ester compounds, oxy, aldehyde and keto compounds, phosphorus acid compounds Natalie Trousof rm 9B32 CP2..... 557-3920

127 Molecular genetics, cell culture, catalysis, enzymology, microbiology and chemical engineering Thomas Wiseman rm 9D31 CP2..... 557-3920

128 Clinical chemistry, microbiology, immunology and enzymology, food technology, purification and chemical engineering Robert Warden rm 8D19 CP2..... 557-3920

129 Herbicides and heterocyclic chemistry Glennon H. Hollrah rm 9A01 CP2..... 557-3920

130 Specialized Chemical Industries and Chemical Engineering rm 8C17 CP3..... 557-2475
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131 Adhesive bonding and miscellaneous chemical manufacture, compositions such as etching compositions Edward C. Kimlin rm 7A01 CP3..... 557-2475

132 Sugar, starch, and food or edible material Raymond Jones rm 8D01 CP3..... 557-2475

133 Paper making and fiber liberation, glass manufacture, methods of cleaning and liquid contact with solids, refrigeration processes, concentrating evaporators, separatory distillation processes and apparatus S. Leon Bashore rm 7E02 CP3 557-2475

134 Chemical apparatus such as analyzers, reactors, sterilizers, crystallizers and dialyzers; processes of chemical analysis, sterilizing, preserving and miscellaneous physical processes such as crystallizing and agglomerating Barry S. Richman rm 9B02 CP3..... 557-2475

135 Gas separation, solids separation and gas and liquid contact
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136 Liquid purification or separation Richard L. Fisher rm 8B36 CP3..... 557-2475
137 Processes of plastic and nonmetallic article shaping or treating
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138 General molding or treating apparatus, static molds, apparatus for cutting lamina, process for molding lamina, miscellaneous formation of lamina such as by freezing or encapsulating, fuel gas formation, thermolytic distillation of materials and apparatus treating mineral oil products Jay H. Woo rm 8B12 CP3 557-2475

150 High Polymer Chemistry, Plastics, Coating, Photography, Stock Materials and Compositions rm 11C19 CP2..... 557-6525
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151 Mixed synthetic resin compositions, block and graft copolymers and irradiation of polymers John Bleutge rm 11C19 CP2..... 557-6525
152 Coating processes and coating apparatus Norman Morgenstern rm 11C19 CP2..... 557-6525
153 Foams, condensation polymers of cellulose, phenols, isocyanates, polyesters, polyepoxides, stabilization of polymers John Knight,III rm 11C19 CP2 557-6525
154 Stock materials or miscellaneous articles of manufacture George Lesmes rm 11C19 CP2..... 557-6525
155 Polymer compositions, addition polymers, and carbohydrates Joseph Schofer rm 11C19 CP2..... 557-6525
156 Radiation imagery chemistry - process, composition or product, and stock materials or miscellaneous articles of manufacture John Kittle rm 11C19 CP2. 557-6525
157 Special utility compositions, coating compositions, dye compositions and processes, textile treating compositions, and abrasive compositions
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212 Motor-generator structure systems and industrial voltage regulation and conversion Patrick R. Salce rm 9A01 CP4..... 557-9695
213 Industrial electrical furnaces, electrical resistors and electric heating, includes microwave heating and welding Bruce Reynolds rm 9D01 CP4..... 557-3231
214 Electrical switches, electrical transmission systems, electrical discharge devices, electrical furnaces and electrical devices David A. Pellinen rm 8B24 CP4..... 557-2885
215 Conductors, insulators, industors, electric photocopying and electrical devices Arthur Grimley rm 9E16 CP4..... 557-7671
216 Recorders, scales, magnets and magnetic and thermal switches
Elliott A. Goldberg rm 8B02 CP4..... 557-2323
217 Motor control, horology, electrical music tone generation, prime-mover synamo plants, electrical elevator controls William M. Shoop, Jr. rm 9D25 CP4..... 557-3191

220/290 Utility and Design Applications rm 10D19 CP4..... 557-2895
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222 Radio, optic, acoustic, wave communications systems and all classified electrical applications Thomas H. Tarcza rm 10E04 CP4..... 557-4923

223 Chemical and including radioactive materials, powder metallurgy, rocket fuels, explosives and thermal and photoelectric batteries as well as all classified chemical applications John Terapane rm 10B30 CP4..... 557-4934

291 Ornamental designs in the area of industrial arts Wallace R. Burke rm 10B04 CP4..... 557-4979

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232 General and special purpose data processing systems and digital arithmetic subsystems James D. Thomas rm 11B02 CP4..... 557-0375

233 Static information storage and retrieval, structural elements of dynamic magnetic information storage or retrieval and record controlled systems Stuart N. Hecker rm 11D01 CP4..... 557-0326

234 Ordnance or weapon system computers, code converters and special applications of computers including vehicle control, navigation, measuring, testing and monitoring Errol A. Krass rm 11B18 CP4..... 557-8055

235 Electrical dynamic information storage and retrieval Raymond F. Cardillo rm 11D17 CP4..... 557-4316

236 Computer control systems, miscellaneous applications of computers, computer aided product manufacturing, robotics, analog and hybrid computers, and error correction and detection systems Jerry Smith rm 11E10 CP4..... 557-8041

237 General and special purpose data processing systems, and speech analysis and synthesis Gareth D. Shaw rm 11B40 CP4..... 557-8047

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241 Packaging art including glass, fabric metal, wood, paper and plastic receptacles plus closures, therefor William I. Price rm 6B02 CP4..... 557-4719

242 Fluid treating, presses, food apparatus, cleaning, agitating, centrifuges, and web feeding Harvey C. Hornsby rm 7A15 CP4..... 557-4317

243 Conduits, bathroom facilities, cleaning apparatus, filling apparatus, switches, and article carriers Stephen Marcus rm 6B21 CP4..... 557-4156

245 Textiles, winding and reeling, pushing and pulling, bearings, and flexible torque transmitters Stuart S. Levy rm 7E16 CP4..... 557-3453

246 Measuring and testing, dynamic information storage or retrieval, optical image projectors and joint packing Charles E. Frankfort rm 6D15 CP4..... 557-3220

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263 Multiplex communications, digital communications and telecommunications Robert L. Griffin rm 5E02 CP4..... 557-1139
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265 Measuring and testing of non-electrical phenomena Stewart Levy rm 6E02 CP4..... 557-6116
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312 Railways and railway equipment, motor vehicle wheels and bodies and article assorting Robert B. Reeves rm 4D17 CP3..... 557-3003
313 Handling implements, fluid conveying and spraying and fire extinguishers Joseph F. Peters,Jr. rm 5D01 CP3..... 557-3680
314 Brakes, fluid pressure brake systems, spring devices and sheet feeding or delivering devices Bruce H. Stoner, Jr. rm 5B18 CP3..... 557-6746
315 Aeronautics and marine arts Trygve M. Blix rm 6A01 CP3..... 557-1471
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322 Electrical connectors, gear cutting, milling and chucks Gil Weidenfield rm 6D35 CP3..... 557-3698
323 Abrading, workholders, and tools Frederick Schmidt rm 7D35 CP3..... 557-6506
324 Cutting, cutlery tools and miscellaneous hardware Robert Kazenske rm 6B18 CP3..... 557-6064
325 Metal founding, fishing, vermin trapping and welding Nicholas Godici rm 7D01 CP3..... 557-6513
326 Metal working, comminution and wire working Howard Goldberg rm 7D17 CP3..... 557-6520
327 Packaging, bookmaking, butchering, and printed matter Robert Spruill rm 6D01 CP3..... 557-6491

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332 Tobacco, toiletry, or exercising devices Richard Apley rm 4E16 CP4..... 557-3131
333 Dentistry, animal husbandry, harvesting and sign exhibiting or back protection devices Louis Mancene rm 4D01 CP4..... 557-3131
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342 Internal combustion engines including charge forming and ignition systems Charles Myhre rm 2D01 CP4..... 557-5690
343 Combustion power plants, reaction meters, pumps, rotary expansible chamber devices Carlton R. Croyle rm 3B02 CP4..... 557-0398
344 Environmental control, including heating, air conditioning, refrigeration and ventilation Albert Makay rm 3D01 CP4..... 557-0397
345 Combustion of fuels and substances, heating the environment and extracting heat from sun Samuel Scott rm 3E02 CP4..... 557-3467
346 Devices and methods for transferring heat from one material to another, turbochargers, superchargers, poppet valve operation and exhaust gas treatment for internal combustion engines, rotary internal combustion engines and powerplant of the type using natural heat William Cline rm 2B02 CP4..... 557-5679
347 Fluid handling which includes valves, pressure regulators and flow controllers for liquids and gases Martin Schwadron rm 3D41 CP4..... 557-6777

350 General Constructions, Petroleum and Mining Engineering rm 3C17 CP3..... 557-6200
Director Al Lawrence Smith rm 3D17 CP3..... 557-3414
Secretary Carol M. Sinclair rm 3D19 CP3..... 557-3414
Clerk Joyce G. Hill rm 3D13 CP3..... 557-6200
351 Joints and connections, pipe couplings, fences, earth & hydraulic engineering Cornelius J. Husar rm 4D01 CP3..... 557-6200
352 Gearing, power transmissions, clutches, machine elements Leslie A. Braun rm 3E16 CP3..... 557-6200
354 Building structures and components (Vacant) rm 3D21 CP3..... 557-6200
355 Supports, racks, fire escapes, ladders, scaffolds, flexible partitions Ramon S. Britts rm 4E02 CP3..... 557-6200
356 Petroleum, mining, highway and bridge engineering, well drilling, and endless belts James A. Leppink rm 4D35 CP3..... 557-6200
357 Tables, chairs, cabinets, windows, doors, buckles, buttons, clasps William E. Lyddane rm 4A01 CP3..... 557-6200
358 Fasteners, safes, locks, closure fasteners, beds, control levers and linkages Gary L. Smith rm 3E02 CP3..... 557-6200

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Patent and Trademark Information rm 1A05 CP2..... 557-3158
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Michael S. Keplinger rm. 11C28 CP3..... 557-3065

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Budget Analyst Maude A. Williams rm 11C17 CP3..... 557-2222
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Secretary Trish Appelle rm 3C06 CP2..... 557-3268

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Secretary Ann Farson rm 3C06 CP2..... 557-3268
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Application & Classification Section Leon Jackson rm 4B30 CP2..... 557-5255
Publication & Issue Supervisor Tony Milligan rm 4C23 CP2..... 557-5247
Post Registration Sec. Supervisor Portia Taylor rm 4C24 CP2..... 557-1986
Affidavit Examiners rm 4C24 CP2..... 557-1988
Renewal Examiners rm 4C24 CP2..... 557-1988
Mail Reader/Messenger Lilly Mott/Edmond Scott rm 4C26 CP2..... 557-5257
Microfilm Section Lavette Favors & Della Williams rm 4D27 CP2..... 557-5255

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Transportation Unit Jesse Holt FERN 557-1531
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Official Search Unit Daisy Johnson FERN 557-9690

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Micrographics Branch (Crystal) Calvin Pullen..... 557-3079
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Certification Section Lannie Anderson 1627 HCHB..... 377-4849
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Microfiche and Printing Mary Gartrell 1627 HCHB..... 377-4401
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CM1	Crystal Mall 1, 1911 Jefferson Davis Highway
CM2	Crystal Mall 2, 1921 Jefferson Davis Highway
CP1	Crystal Plaza 1, 2001 Jefferson Davis Highway
CP2	Crystal Plaza 2, 2011 Jefferson Davis Highway
CP3	Crystal Plaza 3, 2021 Jefferson Davis Highway
CP4	Crystal Plaza 4, 2204 Jefferson Davis Highway
CP6	Crystal Plaza 6, 2221 Jefferson Davis Highway
CP34	Crystal Plaza 34, 2021 Jefferson Davis Highway
CS4	Crystal Square 4, 1745 Jefferson Davis Highway
CS5	Crystal Square 5, 1755 Jefferson Davis Highway
CG2	Crystal Gateway 2, 1225 Jefferson Davis Highway
PK 1	Crystal Park 1, 2011 Crystal Drive
EADS	1232 South Eads Street
FERN	1411 South Fern Street
HCHB	Herbert C. Hoover Building, 14th & Constitution Avenue, N.W.

PATENT NOTICES

Certificates of Correction for the Week of Feb. 25, 1986

PLT. 5,585	4,520,113	4,542,749	4,551,907
4,255,320	4,520,145	4,543,081	4,551,931
4,104,248	4,520,681	4,543,231	4,552,513
4,300,139	4,522,293	4,543,350	4,552,638
4,406,703	4,522,907	4,543,609	4,553,271
4,429,958	4,523,357	4,544,035	4,553,328
4,431,157	4,523,634	4,544,697	4,553,616
4,439,936	4,526,622	4,544,760	4,553,954
4,449,784	4,526,786	4,544,943	4,554,389
4,468,511	4,527,385	4,545,434	4,555,022
4,469,434	4,529,500	4,545,438	4,555,534
4,477,648	4,530,591	4,545,713	4,555,623
4,478,109	4,531,779	4,546,147	4,555,817
4,483,280	4,531,838	4,546,182	4,555,875
4,485,869	4,532,473	4,546,280	4,556,576
4,487,505	4,532,781	4,547,199	4,557,075
4,490,235	4,532,977	4,547,223	4,557,238
4,491,558	4,532,981	4,547,576	4,557,316
4,495,561	4,533,228	4,547,727	4,557,579
4,496,759	4,534,022	4,548,056	4,557,771
4,499,165	4,534,602	4,548,079	4,557,776
4,508,625	4,537,130	4,548,212	4,558,184
4,509,063	4,537,322	4,548,613	4,558,203
4,510,050	4,537,927	4,548,706	4,558,767
4,511,239	4,538,540	4,548,934	4,559,009
4,511,465	4,539,441	4,549,122	4,559,382
4,512,158	4,540,866	4,549,706	4,559,516
4,513,062	4,541,714	4,549,939	4,559,536
4,517,012	4,542,067	4,550,427	4,559,997
4,517,074	4,542,073	4,550,526	4,560,110
4,519,007	4,542,327	4,551,493	4,560,260
4,519,783	4,542,518	4,551,639	4,561,998
4,519,905	4,542,531	4,551,766	

Disclaimers

Des. 273,564.—*Peter Spielhoff,* Dortmund, Fed. Rep. of Germany. PLASTIC BOTTLE. Patent dated Apr. 24, 1984. Disclaimer filed Dec. 12, 1985, by the assignee, *Teroson G.m.b.H.*

Hereby enters this disclaimer to said claim of said patent.

3,399,545.—*Gordon K. Anderson,* Tustin, *Richard A. Evans,* Newport Beach, and *Ralph H. Hilmer,* Corona Del Mar, Calif. APPARATUS FOR CONNECTING A STATIONARY AIR CONDITIONING UNIT TO AIRCRAFT. Patent dated Sept. 3, 1968. Disclaimer filed May 20, 1985, by the assignee, *Lear Siegler, Inc.*

Hereby enters this disclaimer to claims 1, 7, 8, 12 and 14 of said patent.

3,810,868.—*Lewis B. Weisfeld,* Princeton, N.J. and *Robert C. Witman,* Cincinnati, Ohio. DIMETHYLTIN MERCAPTO ESTER STABILIZERS FOR HALOGENATED RESINS. Patent dated May 14, 1974. Disclaimer filed Nov. 8, 1985, by the assignee, *Morton Thiokol, Inc.*

The term of this patent subsequent to Feb. 9, 1989 has been disclaimed.

3,952,107.—*Fumio Shibata,* Nagoya, Japan. GROWTH PROMOTION USING A CERTAIN GLYCERIDE MIXTURE. Patent dated Apr. 20, 1976. Disclaimer filed Nov. 21, 1985, by the assignee, *Nihon Nohyaku Kabushiki Kaisha.*

Hereby enters this disclaimer to all claims of said patent.

3,926,892.—*Frank O. Holcombe, Jr.,* Beltsville, Md. HYDROPHILIC CONTACT LENSES AND LENS POLYMER. Patent dated Dec. 16, 1975. Disclaimer filed Nov. 26, 1985, by the assignee, *Alcon Laboratories, Inc.*

The term of this patent subsequent to Nov. 25, 1985, has been disclaimed.

4,338,702.—*Harry H. Holly,* Boca Raton, Fla. APPARATUS FOR MAKING A GROUND FOOD PATTY. Patent dated July 13, 1982. Disclaimer filed Dec. 20, 1985, by the assignee, *Holly Systems, Inc.*

The term of this patent subsequent to June 15, 1998, has been disclaimed.

Dedication

4,396,675.—*Gaylord L. Groff,* St. Paul, Minn. STORABLE, CROSSLINKABLE PRESSURE-SENSITIVE ADHESIVE TAPE. Patent dated Aug. 2, 1983. Dedication filed Dec. 23, 1985, by the assignee, *Minnesota Mining and Manufacturing Co.*

Hereby dedicates to the public the entire remaining term of said patent.

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Wisconsin	Madison: Kurt F. Wendt Engineering Library, University of Wisconsin	(608) 262-6845
	Milwaukee Public Library	(414) 278-3247

All of the above-listed libraries offer CASSIS (Classification And Search Support Information System), which provides direct, on-line access to Patent and Trademark Office data.

*Collection organized by subject matter.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

JAMES E. DENNY, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF January 18, 1986

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, AND ENGINEERING, GROUP 110—D. E. TALBERT, Director	6-15-84
ORGANIC CHEMISTRY AND BIOTECHNOLOGY, GROUP 120—C. E. VAN HORN, Director	2-15-84
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 130—R. F. WHITE, Director	4-12-84
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY, STOCK MATERIALS AND COMPOSITIONS, GROUP 150—J. O. THOMAS, Director	3-01-85
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—G. GOLDBERG, Director	3-02-84
SPECIAL LAWS ADMINISTRATION, GROUP 220—K. L. CAGE, Director	3-21-83
INFORMATION PROCESSING, STORAGE, AND RETRIEVAL, GROUP 230—E. LEVY, Director	11-21-83
PACKAGES, CLEANING, TEXTILES, AND GEOMETRICAL INSTRUMENTS, GROUP 240—E. E. KUBASIEWICZ, Director	6-15-84
ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 250—S. S. MATTHEWS, Director	3-28-83
COMMUNICATIONS, MEASURING, TESTING AND LAMP/DISCHARGE GROUP, GROUP 260—S. G. KUNIN, Director	8-30-83
DESIGN, GROUP 290—K. L. CAGE, Director	3-14-83
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director	7-12-83
MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 320—S. N. ZAHARNA, Director	5-09-84
MECHANICAL TECHNOLOGIES AND HUSBANDRY PERSONAL TREATMENT INFORMATION, GROUP 330—R. E. AEGERTER, Director	3-30-83
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 340—D. J. STOCKING, Director	10-19-83
GENERAL CONSTRUCTIONS, PETROLEUM AND MINING ENGINEERING, GROUP 350—A. L. SMITH, Director	1-07-85

Expiration of patents: The patents within the range of numbers indicated below expire during January 1986, except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents . . . . . Numbers 3,419,907 to 3,425,059, inclusive

Plant Patents . . . . . Numbers 2,856 to 2,860 inclusive

REEXAMINATIONS

FEBRUARY 25, 1986

Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

B1 3,837,872 (469th)
METHOD OF MAKING WASTES NON-POLLUTING AND DISPOSABLE
Jesse R. Conner, Pittsburgh, Pa., assignor to National Environmental Controls, Inc., Metarie, La.
Reexamination Request No. 90/000,668, Nov. 13, 1984.
Reexamination Certificate for Patent No. 3,837,872, issued Sep. 24, 1974, Ser. No. 215,421, Jan. 4, 1972.
Continuation-in-part of Ser. No. 1,554, Jan. 8, 1970, abandoned.
Int. Cl.[4] C04B *31/00*
U.S. Cl. 106—74

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims 1 and 2 are cancelled.

Claim 3 is determined to be patentable as amended.

New claims 4–43 are added and determined to be patentable.

3. [A method according to claim 1, in which] *A method of treating liquid and semi-liquid wastes to render them non-polluting and fit for ultimate disposal, comprising mixing an aqueous solution of an alkali metal silicate with liquid or semi-liquid waste and a silicate setting agent from the group consisting of Portland cement, lime, gypsum, and calcium chloride to cause the silicate and setting agent to react with each other, the proportion of alkali metal silicate and setting agent being such that the reaction converts the mixture into a consolidated chemically and physically stable solid product substantially insoluble in water and with its pollutants entrapped in the solidified silicate,* the amount of alkali metal silicate and setting agent [forms] *forming* less than about 10 percent by volume of the mixture.

5. A method of treating liquid and semi-liquid wastes to render them non-polluting and fit for ultimate disposal, comprising mixing an aqueous solution of an alkali metal silicate with liquid or semi-liquid waste and a silicate setting agent from the group consisting of Portland cement, lime, gypsum and calcium chloride to cause the silicate and setting agent to react with each other, the proportions of alkali metal silicate and setting agent being such that the reaction converts the mixture into a consolidated chemically and physically stable product having a clay-like consistency, the product being substantially insoluble in water and with its pollutants entrapped in the solidified silicate.

B1 4,232,614 (470th)
PROCESS OF INCINERATION WITH PREDRYING OF MOIST FEED USING HOT INERT PARTICULATES
Elliot B. Fitch, Auburn, Ala., and Orris E. Albertson, Salt Lake City, Utah, assignors to Dorr-Oliver Incorporated, Stamford, Conn.
Reexamination Request No. 90/000,796, Jun. 11, 1985.
Reexamination Certificate for Patent No. 4,232,614, issued Nov. 11, 1980, Ser. No. 46,392, Jun. 6, 1979.
Continuation-in-part of Ser. No. 856,379, Dec. 1, 1977, Pat. No. 4,159,682.
Int. Cl.[4] F23G *5/04*
U.S. Cl. 110—235

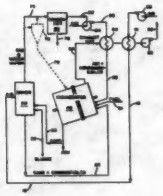
AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claim 3 is cancelled.

Claims 1 and 4 are determined to be patentable as amended.

Claim 2, dependent on a amended claim, is determined to be patentable.

1. A process for combustion of moist combustible feed wherein said moist feed is first dried and then introduced into a combustion zone containing inert, particulate material comprising, withdrawing a quantity of hot, inert, particulate material from said combustion zone, intimately contacting said moist feed with said hot particulate material in a drying zone



without any substantial addition of air to evaporate the water in the feed at a relatively low temperature, removing water vapor and non-condensable gas from said drying zone in a gas stream, removing the dried solids from said drying zone and charging said dried solids into said combustion zone for combustion, treating said gas stream to remove and dispose of the water vapor therein, forwarding the balance of the gas stream to the combustion zone for deodorizing by heating to elevated temperature and exhausting the gases from said combustion zone to the atmosphere with or without further treatment.

B1 4,319,576 (471st)
INTRALUMENAL ANASTOMOSIS SURGICAL STAPLING INSTRUMENT
Robert G. Rothfuss, Bellevue, Ky., assignor to Senmed, Inc., Cincinnati, Ohio
Reexamination Request No. 90/000,656, Oct. 24, 1984.
Reexamination Certificate for Patent No. 4,319,576, issued Mar. 16, 1982, Ser. No. 124,954, Feb. 16, 1980.
Int. Cl.[4] A61B *17/04, 17/32*
U.S. Cl. 128—305

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

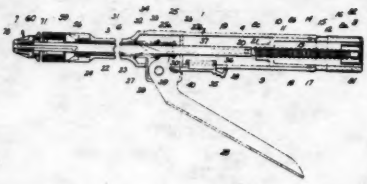
The patentability of claims 1–20 and 23–29 is confirmed.

Claim 21 is determined to be patentable as amended.

Claim 22 dependent on an amended claim, is determined to be patentable.

New claim 30 is added and determined to be patentable.

1. A surgical stapling instrument of the type used to join together tubular body organs, said surgical stapling instrument comprising an elongated body having first and second ends, a cylindrical casing affixed coaxially on said first end of said body, at least one annular array of surgical staples mounted within said casing, an adjusting rod coaxially mounted within said body and said casing, said adjusting rod having a first end extending beyond said casing, an anvil mounted on said first end of said adjusting rod, said anvil having an anvil surface facing said casing, an adjustment knob mounted at said second end of said body, said adjustment knob being hollow, said adjusting rod being operatively connected to said adjustment knob, said adjusting rod and said anvil being axially shiftable by operation of said adjustment knob between a position wherein said anvil surface is adjacent said casing and a position wherein said anvil surface is spaced from said casing, a staple driver and a cylindrical scalpel located within said casing,



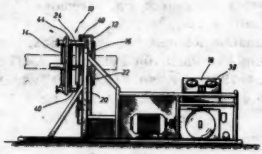
means to shift said staple driver and said scalpel from a retracted position within said casing toward said anvil to drive said staples through said tubular body organs to be joined, to clinch said staples against said anvil surface and to sever excess portions of said tubular body organs over a range of distances between said anvil surface and said casing constituting a working gap of said instrument, said adjusting rod having a second end located within said hollow adjustment knob, indicator means mounted on said second end of said adjusting rod and being so configured as to give both visual and tactile indications that the distance between said anvil surface and said casing is at and within said working gap, a scale in association with one of said adjustment knob and said second end of said body and a cooperating indicator mark on the other of said adjustment knob and said second end of said body enabling final adjustment of said distance between said anvil surface and said casing within said working gap according to the thickness of the tissue of the tubular body organs being joined.

B1 4,445,402 (472nd)

POWER TONG AND BACK-UP TONG ASSEMBLY

Garth M. Farr, Kingwood, and Patrick R. Callihan, Houston, both of Tex., assignors to Farr Oil Tool, Inc., Houston, Tex.

Reexamination Request No. 90/000,616, Aug. 31, 1984.
Reexamination Certificate for Patent No. 4,445,402, issued May 1, 1984, Ser. No. 352,244, Feb. 25, 1982.
Int. Cl.[4] B25B *17/00*
U.S. Cl. 81—57.16



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **5, 6, 8, 13** and **15** is confirmed.

Claims **1–4, 7, 9–12, 14** and **16–18** are cancelled.

[1. An assembly for threadably joining or disjoining tubular members comprising:

a first tong adapted to receive and rotate a first tubular member in a first direction, said first tong being of the type having a rotatable cam surface and a jaw assembly disposed between the cam surface and such a first tubular member in a manner that rotation of the cam surface acts to bring the jaw assembly into a gripping relationship with, and thereby rotate such a first tubular member;

a second tong adapted to receive and hold a second tubular member in a fixed position relative to a first tubular member, said second tong comprising:

a fixed cam ring having a cam surface, said cam ring being axially aligned with the rotatable cam surface of the first tong;

a second jaw assembly rotatable in said first direction which acts against the cam surface of the fixed cam ring so as to be urged into a gripping relationship with such a second tubular member; and

means for rotating the second jaw assembly until an initial gripping relationship is achieved with such a second tubular member.]

REISSUES

FEBRUARY 25, 1986

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 32,085

TUBULAR MEMBER INTERIOR WIPER

Archie K. Haggard, Houston, Tex., assignor to Haggard I. D. Wiper, Inc., Houston, Tex.

Original No. 4,287,948, dated Sep. 8, 1981, Ser. No. 74,843, Sep. 13, 1979. Continuation-in-part of Ser. No. 25,302, Mar. 30, 1979, abandoned. Application for reissue Sep. 2, 1983, Ser. No. 529,061

Int. Cl.[4] E21B *37/02*

U.S. Cl. 166—170 **10 Claims**

1. A wiper for wiping liquids from the interior walls of a bore of a member as it is removed from a bore hole comprising,

a buoyant chamber having a closed top and a bottom effective to float the wiper in liquids in the bore of the member and being smaller in external diameter than the smallest bore of the member in which the wiper is to be used,

[a flexible centralizer connected to the wiper adjacent the bottom of the buoyant chamber arranged to permit movement of liquid past it, the centralizer extending outwardly sufficiently to centralize the bottom portion of the wiper in the bore of the member and flexible enough to readily pass through the smallest bore of the member,]

a mandrel yieldingly connected to and extending upwardly from the buoyant chamber,

first and second flexible wipers provided with drain openings through them, the wipers extending outwardly far enough to engage and arranged to circumferentially wipe the largest bore and flexible enough to readily retract to pass through and circumferentially wipe the smallest bore of the member,

means securing the first and second wipers to the mandrel, the first and second wipers being axially spaced from one another a distance sufficient to permit ready passage through the smallest bore of the member and to centralize the wiper's upper portion in the bore of the member,

whereby the wiper floats in the liquid in the bore with the first and second wipers above the liquid, and as the member is removed from the well bore, the first and second wipers wipe the bore of the member of liquid and any of the liquid above the wipers drains through the drainholes, and means for equalizing pressure within the buoyant chamber with pressure in the well bore comprising an open passageway extending into a lower portion of the buoyant chamber,

the bouyant chamber, [the flexible centralizer,] the mandrel and the first and second wipers formed of material which will not cause an explosion of an explosive mixture when rubbing or striking the interior walls of the member.

Re. 32,086

SOLDER REMOVING DEVICE

Ernst Spirig, P.O. Box 1140, CH-8640 Rapperswil, Switzerland

Original No. 4,416,408, dated Nov. 22, 1983, Ser. No. 266,324, May 22, 1981. Application for reissue Apr. 19, 1985, Ser. No. 724,830

Claims priority, application United Kingdom, Mar. 16, 1981, 8108110

Int. Cl.[4] B23K *1/00*

U.S. Cl. 228—19 **7 Claims**

1. A solder removing device, comprising

(a) an open-mesh structure including at least one strand and being formed by knitting, weaving, stranding, braiding or crochetting,

(b) adjacent sections of said strand being in non-contiguous relation thereby defining open spaces for absorbing molten solder,

(c) at least the surface portion of said strand being metallic and receptive to solder flux,

(d) said surface portion being coated with solder flux to render it more capable of wetting with molten solder.

Re. 32,087

4H-3,1-BENZOXAZINE DERIVATIVES

Gerhard Hamprecht, Weinheim, and Bruno Wuerzer, Otterstadt, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Original No. 4,315,766, dated Feb. 16, 1982, Ser. No. 138,414, Apr. 8, 1980. Application for reissue Jun. 21, 1983, Ser. No. 506,316

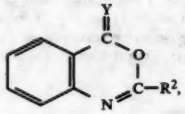
Claims priority, application Fed. Rep. of Germany, Apr. 12, 1979, 2914915

The portion of the term of this patent subsequent to Dec. 14, 1999, has been disclaimed.

Int. Cl.[4] A01N *43/86*; C07D *265/20, 265/22*

U.S. Cl. 71—88 **13 Claims**

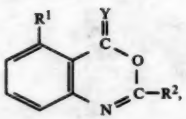
1. 4H-3,1-Benzoxazine derivatives of the formula



where

Y is oxygen or sulfur, R^2 *is* $Ar(R^6)_n$, Ar denoting phenyl, R^6 denoting haloalkoxy or haloalkylmercapto, each of 1 to 4 carbon atoms, and n being 1 or 2.

11. 4H-3,1-Benzoxazine derivatives of the formula



where R^1 is fluorine or chlorine, Y is oxygen or sulfur and R^2 is phenyl.

Re. 32,088

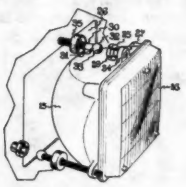
SNAP IN COUPLING ASSEMBLY FOR A VEHICLE HEADLAMP

Jiri G. Sip, Brunswick, Ohio, assignor to General Electric Company, Schenectady, N.Y.

Original No. 4,318,162, dated Mar. 2, 1982, Ser. No. 85,354, Oct. 16, 1979. Application for reissue Nov. 3, 1982, Ser. No. 438,682

Int. Cl.[4] F21V *19/02*

(I) U.S. Cl. 362—368 6 Claims



6. [The] *A sealed beam* vehicle headlamp assembly [of claim 1] *comprising a lamp unit having a light source sealed within and focused relative to an envelope including a reflector and a light transmissive lens for producing a light beam having an axis substantially parallel to the optical axis of said lamp unit, three separate couplers integral with the exterior surface of said envelope and disposed about said envelope in a triangular configuration, each of said couplers having a substantially spherical mating surface defined by a ball and socket joint which is substantially centered for pivotal movement about a point, the points defining a plane substantially perpendicular to the axis of said light beam, and said couplers being disposed to provide both horizontal and vertical adjustment of said light beam,* wherein said lamp couplers [are fixed in relation to said lamp unit and] *further* include adjustment access openings [therethrough] *extending through the socket element of the ball and socket joint but not through the ball element of said joint.*

PLANT PATENTS

GRANTED FEBRUARY 25, 1986

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

5,670

MINIATURE ROSE PLANT

Cecilia L. D. Bennett, 489 Minot Ave., Chula Vista, Calif. 92010

Filed Aug. 22, 1983, Ser. No. 525,452
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—9 1 Claim

1. A new and distinct variety of miniature rose plant named 'Think Pink' of hardy, dwarf, bush, much branched habit, substantially as illustrated and described, characterized by its blooms of Carmine Rose Pink with softer shades of Carmine Rose on the outer petals and a fragrance of 'fresh apples', easy to propagate from cuttings, with flowers usually borne singly or in sprays of 3 to 5 or more.

5,671

MINIATURE ROSE PLANT 'MINKCO'

Ernest D. Williams, 1510 Lebanon Ave., Dallas, Tex. 75208

Filed May 2, 1984, Ser. No. 606,396
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—10 1 Claim

1. A new and distinct variety of miniature rose plant of hardy, dwarf, bushy, rounded, much branched habit, substantially as illustrated and described, characterized by buds and flowers which are of a deep red color, often with blackish shading, with pointed buds of good substance suitable for cutting and exhibition,; and further characterized by a plant which is easy to propagate from soft wood cuttings, with an abundance of flowers usually borne singly on slender wirey stems.

5,672

HYBRID MINIATURE MOSS ROSE PLANT CV. AROMIKEH

Jack E. Christensen, Ontario, Calif., assignor to Armstrong Nurseries, Inc., Ontario, Calif.

Filed May 18, 1984, Ser. No. 612,004
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—10 1 Claim

1. A new variety of bush rose of the hybrid miniature moss class, substantially as illustrated and described herein, being particularly characterized by a combination of features including its low, rounded, compact habit; its abundant production of brightly colored red flowers displayed well above the foliage; its ability to drop its flower petals cleanly before they fade off-color with age; its abundance of deep green, glossy foliage that attractively clothes the entire plant; its long, pointed, well-formed buds, unusual among moss roses; and its moderately "mossed" sepals which provide a sweet muscosa rose fragrance in the bud stage.

5,673

HYBRID TEA ROSE PLANT CV. DELMATOR

Georges A. Delbard, Paris, France, assignor to Armstrong Nurseries, Inc., Ontario, Calif.

Filed May 18, 1984, Ser. No. 612,005
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—17 1 Claim

1. A new and distinct variety of rose plant of the hybrid tea class, essentially as herein illustrated and described, being particularly characterized by its flowers of a uniform orange-red coloration; its long, pointed bud form; its abundant and nearly continual year-round production of blooms borne on long cutting stems; its abundant, deep green foliage; and its above-average disease resistance.

5,674

STRAWBERRY PLANT-BURLINGTON

Chester S. Schwartze, Puyallup, Wash., and Atsusa Sakuma, deceased, late of La Conner, Wash. by Grace Insakuma, executrix, assignors to Sakuma Bros. Farms, Inc., Burlington, Wash.

Filed Mar. 30, 1984, Ser. No. 594,799
Int. Cl.[4] A01H *5/03*
U.S. Cl. Plt.—49 1 Claim

1. The new and distinct variety of everbearing strawberry plant herein described and illustrated and identifiable by reference to the characteristics enumerated and described above.

5,675

KALANCHOE PLANT NAMED MONTERAY

Claude Hope, Cartago, Costa Rica, assignor to Pan American Plant Company, Parrish, Fla.

Filed Mar. 27, 1984, Ser. No. 594,489
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—68 1 Claim

1. A new and distinct cultivar of Kalanchoe plant named Monteray, as described and illustrated, and particularly characterized by its large salmon colored flowers and floriferous habit; compact and freely branching habit; large, medium green succulent foliage, and by its adaptability to production in 10–15 cm. pots.

PATENTS

GRANTED FEB. 25, 1986

ERRATA

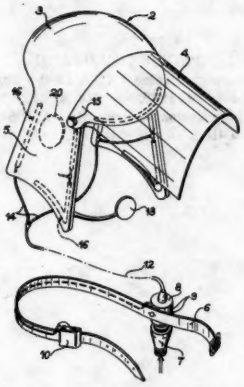
For CLASS	See PATENT NO.
623–014	4,571,749
623–025	4,571,750
074–485	4,571,786
355–003	4,572,631
411–022	4,572,708
414–146	4,572,710
534–012	4,572,802
534–016	4,572,803
362–123	4,573,102
264–520	4,573,129

PATENTS

GRANTED FEBRUARY 25, 1986

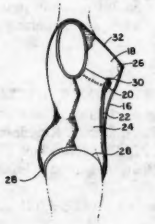
GENERAL AND MECHANICAL

4,571,741
ERGONOMIC HELMET MEANS
Jacques Guillaumot, Fabregue, France, assignor to Commissariat a l'Energie Atomique, Paris, France
Filed Dec. 26, 1984, Ser. No. 686,234
Claims priority, application France, Dec. 27, 1983, 83 20849
Int. Cl.[4] A42B *1/00*
U.S. Cl. 2—8 **8 Claims**



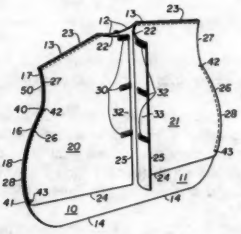
1. An ergonomic helmet means of the type comprising a helmet-like part equipped with a vizor displaceable between a lowered position and a raised position, as well as a system for supplying air to said helmet-like part by means of an external air source equipped with a control means, wherein the control means simultaneously ensures the ventilation and manipulation of the vizor, said control means having an operative position simultaneously ensuring the lowering of the vizor and its maintenance in its lowered position, together with normal ventilation and an inoperative position simultaneously ensuring the raising of the vizor and its maintenance in the raised position, together with a reduced air admission forming a screen around the operator's face.

4,571,742
SWIMSUIT
Carol W. Wior, Los Angeles, Calif., assignor to Wior Corporation, Los Angeles, Calif.
Filed Jun. 28, 1985, Ser. No. 749,895
Int. Cl.[4] A41D *5/00*
U.S. Cl. 2—67 **8 Claims**



6. A swimsuit, comprising:
an elastic outer bathing garment which covers the female torso, the outer garment having a padding-free front breast cover;
a form-fitting inner liner garment which engirdles the female loin;
the inner liner being sewn along its edge to the border of the outer garment, except along an upper breast-engaging perimeter;
a pair of arcuate breast-supporting stays secured to the upper perimeter of the inner liner and secured only at each end to the front breast cover of the outer garment, for supporting the breasts and permitting a natural appearance.

4,571,743
COVERLET FOR NON-AMBULATORY PATIENTS
Dorothy M. Wagoner, 1620 Rover Rd., Modesto, Calif. 95351
Filed Jun. 10, 1985, Ser. No. 742,772
Int. Cl.[4] A41D *3/08*
U.S. Cl. 2—88 **10 Claims**



1. Coverlet comprising:
right and left front panels, each having a vertical seam edge, a horizontal front bottom edge disposed perpendicular to, adjacent to and below said seam edge, a curved front neck notch disposed generally opposite to said front bottom edge and adjacent to said seam edge, a sloping front shoulder edge disposed adjacent to said front neck notch and sloping downward toward said front bottom edge and away from said seam edge, and a curvilinear front edge disposed adjacent to said front bottom edge and said front shoulder edge having an arched upper front portion disposed concave with respect to said seam edge and an arched lower front portion disposed convex with respect to said seam edge;
means for attaching said right front panel to said left front panel along said seam edges;
right and left back panels, each having a vertical opening edge, a horizontal back bottom edge disposed perpendicular to, adjacent to and below said opening edge, a curved back neck notch disposed generally opposite to said back bottom edge and adjacent to said opening edge, a sloping back shoulder edge disposed adjacent to said back neck notch and sloping downward toward said back bottom edge and away from said opening edge, and a curvilinear back edge disposed adjacent to said back bottom edge and said back shoulder edge having an arched upper back portion disposed concave with respect to said opening edge and an arched lower back portion disposed convex with respect to said opening edge;
means for attaching said right front panel to said right back panel and said left front panel to said left back panel along said front shoulder edges and said back shoulder edges and along said lower front portion of said curvilinear front edges and said lower back portion of said curvilinear back edges; and

means for removably attaching said right back panel to said left back panel along said opening edges.

4,571,744

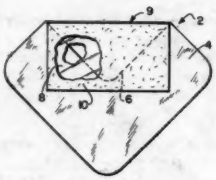
OUTFIT OF INSULATED CLOTHING FOR INFANTS

Jerry H. Lesh, 8015 Urbann Rd., Manassas, Va. 22110

Filed Apr. 24, 1984, Ser. No. 603,298

Int. Cl.[4] A41B *9/00*

U.S. Cl. 2—111 **4 Claims**



1. An outfit of thermally insulated clothing for maintaining body temperature in an infant comprising a multi-layer thermally insulated wrap-around blanket wherein said blanket comprises

(a) as an outer layer, placed away from the body of the infant, a sheet of cloth fabric having an inner side and an outer side;

(b) as a middle layer, a layer of thermally insulating reflecting foil material having at least one reflecting surface, secured to the inner side of the sheet of cloth fabric said at least one reflecting surface for facing towards the body of the infant and away from the inner side of the sheet of cloth fabric;

(c) as an inner layer, placed adjacent to the body of the infant, a layer of cloth lining material secured to said outer layer and said middle layer, coextensive with and covering the at least one reflecting surface of said layer of reflecting foil material;

(d) means for securing together said outer layer, said middle layer and said inner layer to form the multi-layer blanket; and

(e) two strips of adhesive fabric tape secured to the outer side of the sheet of fabric which comprises the outer layer of the blanket.

4,571,745

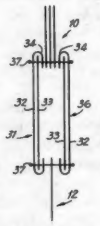
MULTI-PLY GARMENT COMPONENT AND METHOD OF FABRICATION

Michael P. Albert, 32 Kelveden Rd., Newton, Mass. 02168

Filed May 24, 1984, Ser. No. 613,689

Int. Cl.[4] A41B *3/00*

U.S. Cl. 2—139 **15 Claims**



1. A multi-ply garment component comprising at least two outer fabric plies, each outer fabric ply having a heat fusible resin deposited on the inner surface thereof and the edges of each outer fabric ply folded over and fused to form a fused outer fabric ply, each fused fabric ply having a dimension substantially that of the component;

at least one of the outer fabric plies including a cut fabric interlining having a dimension corresponding substantially to the component and smaller than the outer fabric ply, the cut interlining placed onto the outer fabric ply and the edges of the outer fabric ply which extend beyond the interlining folded over the interlining and fused substantially along the region of the folded over fabric ply by the application of heat and pressure to form a creased fabric-/interlining intermediate; and

the fused fabric plies with folded edges placed in alignment with the inner surfaces facing each other and switched along the folded edges to form the garment component.

4,571,746

COLLAPSIBLE HEADBAND

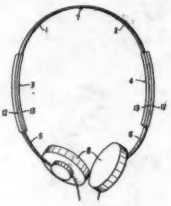
Rudolf Görike, Sternwartestrasse 57C, A-1180 Vienna, Austria

Filed Feb. 24, 1983, Ser. No. 469,295

Claims priority, application Austria, Mar. 1, 1982, 768/82

Int. Cl.[4] H04R *1/10;* **H04M** *1/05;* **A42B** *1/06*

U.S. Cl. 2—209 **1 Claim**



1. A headband assembly comprising first and second headbands each having a first metal end, each first metal end being pivotally interconnected so that said headbands are foldable about the pivotal interconnection inwardly and outwardly in a single plane, said headbands each having a second metal end, an earpiece carried by each of said second metal ends of said headbands, said headbands each comprising at least three separate parts which are telescopically interengaged with each other and which are of substantially equal length, each of said headbands having a central part and a pair of metal strip end parts telescopically engaged with said central part, one metal strip end part of each headband carrying said first metal end and another metal strip end part of each headband carrying said second metal end, said central part of each headband being curved, being made of plastic and defining a pair of elongated rectangular channels which are substantially the same in length as lengths of said metal strip end parts so that said end parts can telescope into said channels with ends of said end parts opposite from said first and second ends of said headbands always being within said channels, said end parts being made of spring steel, the central part of each headband defining said channels to be one on top of the other and superimposed.

4,571,747

HELMET WITH VISOR MECHANISM

Michael Briggs, St Albans, United Kingdom, assignor to Helmets Limited, St. Albans, United Kingdom

Filed Feb. 22, 1984, Ser. No. 581,740

Claims priority, application United Kingdom, Mar. 4, 1983, 8306034

Int. Cl.[4] A42B *3/00*

U.S. Cl. 2—424 **7 Claims**

1. A helmet comprising:

(a) a head shell;

(b) a visor carried on the head shell;

(c) a mounting supporting the visor on the head shell and affording rotation of the visor about an axis extending transversely of the head shell; and

(d) a visor locking and release mechanism; wherein said mechanism comprises:

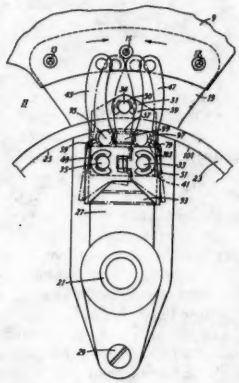
(i) a track fixed relatively to the shell;

(ii) a first arcuate engagement surface formed on the track;

(iii) a second engagement surface opposing said arcuate surface and rotatable with the visor about the axis of said arcuate surface;

(iv) wedging means comprising two roller elements between the first and second engagement surfaces;

(v) biassing means biassing said rollers towards respective first positions; and



(vi) control means having two operating members each provided with a guide surface, the operating members being manually movable against the action of the biassing means to bring the guide surfaces thereof into contact with the respective rollers so as to move the rollers from said first positions thereof to respective second positions thereof at which the spacing between the first and second engagement surfaces is greater than the spacing between those surfaces at the first positions of the rollers, whereby the wedging action of the rollers is released to permit rotation to a desired extent of the visor in either sense about said transversely extending axis while release of the operating members enables return to the first positions thereof of the rollers to cause renewed locking of the arcuate and second engagement surfaces.

4,571,748

FRAMELESS GOGGLE AND METHOD OF MAKING THE SAME

John E. Carroll, and Joseph R. McNeal, both of Ketchum, Id., assignors to Scott USA Limited Partnership, Sun Valley, Id.

Filed Jan. 24, 1983, Ser. No. 460,510

Int. Cl.[4] A61F *9/02*

U.S. Cl. 2—436 **14 Claims**

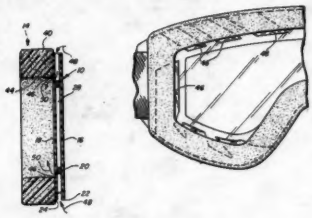
1. A frameless goggle comprising:

inner and outer transparent, generally planar lenses in approximately parallel space relation and deformed into a simple curve;

a spacer being attached to and positioned between said lenses about the periphery of said lenses defining a viewing area through said lenses, said spacer having means for controlling air exchange into a space between said goggle and a wearer's face, said spacer maintaining said spaced relation and deformed simple curve;

a strap connected to at least one of said lenses at spaced locations;

a pliant, flexible cushioning edging secured to said inner lens and extending inwardly from the concave side of said



simple curve to define the space between said goggle and the wearer's face; and

said goggle being free of any external frame receiving or holding said lenses.

4,571,749

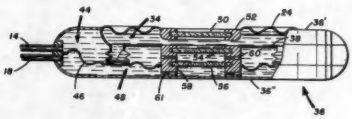
MANUALLY ACTUATED HYDRAULIC SPHINCTER

Robert E. Fischell, Silver Spring, Md., assignor to The Johns Hopkins University, Baltimore, Md.

Filed Sep. 21, 1982, Ser. No. 421,441

Int. Cl.[3] A61F *1/00, 5/00;* A61B *14/00*

U.S. Cl. 623—14 **26 Claims**



1. An implantable hydraulic urinary sphincter system comprising:

an artificial sphincter means for exerting pressure on a patient's urethra;

a control unit having a sphincter fluid chamber filled with incompressible fluid, said sphincter fluid chamber hydraulically coupled to said artificial sphincter means, and wherein pressure exerted by said artificial sphincter means varies according to pressure in said sphincter fluid chamber;

a pressure sensor means for sensing pressure at a preselected location in a patient's body;

a minimum pressure means for biasing fluid pressure in said sphincter fluid chamber to a set minimum pressure; and

a pressure transfer means located within said control unit and directly associated with said sphincter fluid chamber and said pressure sensor means for automatically adjusting fluid pressure in said sphincter fluid chamber depending on pressure sensed by said pressure sensor means.

4,571,750

ACOUSTIC MYOGRAPHY

Daniel T. Barry, Ann Arbor, Mich., assignor to The University of Michigan, Ann Arbor, Mich.

Filed Feb. 21, 1984, Ser. No. 581,949

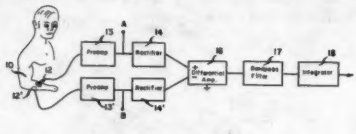
Int. Cl.[4] A61F *1/00*

U.S. Cl. 623—258 **7 Claims**

1. A cybernetic system comprising:

acoustic transducer means adapted to be coupled to a living being for producing an electric signal responsive to a myoacoustic signal produced by said living being, said myoacoustic signal being responsive to contraction and

relaxation states of skeletal muscles of said living being; and



drive means for exerting a mechanical force responsive to said electric signal.

4,571,751

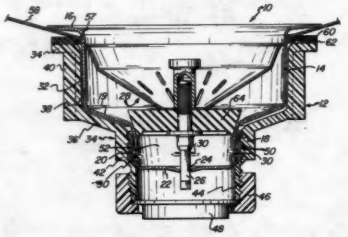
DRAIN ASSEMBLY WITH SYNTHETIC RESIN LOCK NUT AND COUPLING ELEMENTS

J. Bruce Barlow, 259 Woodpond Rd., Glastonbury, Conn. 06033

Filed Dec. 24, 1984, Ser. No. 685,407

Int. Cl.[4] A47K 1/14

U.S. Cl. 4—288 **9 Claims**



1. A drain assembly for a sink, tub, basin, or similar vessel, including: a one-piece drain body of thin wall construction; and an external, two-piece housing comprised of a sleeve member integrally formed of a synthetic resinous material, and a ring-shaped metallic insert firmly secured therewithin; said drain body being comprised of a generally cylindrical sidewall portion, a circumferential flange portion extending outwardly about the upper end of said sidewall portion, and a reduced diameter tubular spout portion at the lower end thereof, said spout portion having thread means formed thereon for engagement with said insert of said housing, said sleeve member of said housing being dimensioned and configured to seat said drain body therewithin, said sleeve member having a circumferential flange portion and a generally cylindrical sidewall portion corresponding to said flange and sidewall portions of said drain body and a tail portion corresponding to said spout portion thereof, said circumferential flange portions of said drain body and housing being adapted to bear upon the opposed surfaces of the wall of an associated vessel about a drain opening therein to fix said drain assembly in position, said cylindrical portions of said body and housing extending in generally parallel relationship, said ring-shaped insert being disposed coaxially within said tail portion of said sleeve member adjacent said sidewall portion thereof and having an internal thread threadably engaged with said thread means of said spout portion to effect interengagement of said drain body and housing, said tail portion of said sleeve member having an externally threaded section extending below said insert to enable threaded connection of a drain conduit to said assembly.

4,571,752

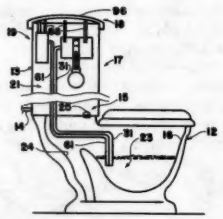
SANITARY DEVICE SYSTEM

Hal W. Bick, P.O. Box 20386, Billings, Mont. 59104

Filed Aug. 21, 1984, Ser. No. 642,880

Int. Cl.[4] E03D 9/02

U.S. Cl. 4—300 **16 Claims**



1. A sanitary device liquid circulation system including a water supply portion, an additive supply portion and an air supply portion; said water supply portion including a water source, a selectively renewable water pool, a delivery passage extending from said water source to said water pool, valve means controlling the flow of water from said water source to said water pool; said additive supply portion including an additive reservoir, a first conduit extending from said reservoir to said delivery passage, metering means disposed along said first conduit, said metering means including a chamber, a movable piston disposed within said chamber, said piston being movable in response to water flow changes in said water supply portion; said air supply portion including an electrical motor, an electrical power source for said motor, timing sequence control means intermittently actuating said motor periodically, pulsing means operatively connected to said motor, pump means including a movable diaphragm responsive to said pulsing means during periods that said motor is operating, an outlet from said pump means, a second conduit extending from said outlet into said water pool, said second conduit including an outlet in said water pool providing a multiplicity of small spaced openings; whereby a predetermined quantity of additive is metered into said pool of water in response to water flow changes in said water supply portion and air periodically is introduced intermittently into said water pool in a multiplicity of bubbles to form and maintain a foam on the surface of said water pool.

4,571,753

TOILET-TANK DISCHARGE VALVE

Reiner Strangfeld, Bückeburg/BRD, Fed. Rep. of Germany, assignor to Georg Rost & Sohne Armaturenfabrik GmbH & Co Kg, Porta Westfalica-Lerbeck, Fed. Rep. of Germany

Filed Sep. 13, 1983, Ser. No. 531,810

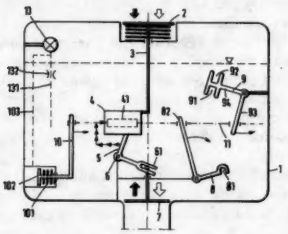
Claims priority, application European Pat. Off., Sep. 15, 1982, 82108502.4

Int. Cl.[4] E03D 1/14, 3/12

U.S. Cl. 4—324 **12 Claims**

1. In a toilet-tank discharge valve having a valve piece that is shiftable into an open position in response to the release activation of an associated activating mechanism and which maintains itself in that position until the flushing process is completed, and then drops into a closed position, and wherein the valve piece is movable back into the closed position before completion of the flushing process by a discontinuance activation of the activating mechanism, the improvement wherein the activating mechanism comprises an activating element identically actuatable to effect release activation and discontinuance activation and a shift mechanism reversably shiftable in opposite operating directions to open and close the valve piece in response to actuation of the activating element to

effect a change of state in a toilet tank due to desired release activation and to a change of state in the toilet tank due to



discontinuance activation and in response to the normal closing of the valve piece upon completion of the flushing process.

4,571,754

TOILET STRUCTURE FOR WALKER

Robert W. England, 1312 Rainier, Grandview, Wash. 98930

Filed Mar. 21, 1983, Ser. No. 477,600

Int. Cl.[4] A47K *11/06*

U.S. Cl. 4—480 **15 Claims**

1. A standup toilet structure for attachment and use on a walker having a walker framework with an open side through which a standing user can move at least partially within the walker framework, comprising:

a toilet frame having at least one elongated bar adapted to extend vertically upon said walker framework;

means for connecting and supporting said elongated bar upon said walker framework in a vertical orientation;

support arm means connected to the elongated bar and extending transversely outward therefrom;

a toilet receptacle having relatively thin front and rear walls and relatively elongated side walls for allowing a user to stand astride thereof, said toilet receptacle being adapted to detachably mount upon said toilet frame and said support arm means with said thin front wall adjacent to said elongated bar; and

means for detachably restraining said toilet receptacle upon said toilet frame;

whereby a user can support and stabilize himself or herself in a standing position at least partially within the walker while also standing astraddle the toilet receptacle and using the toilet structure.

4,571,755

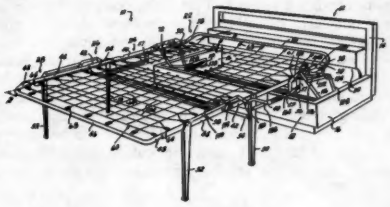
FRAME SUPPORT FOR SOFA-SLEEPER

John E. Stevens, Carthage, Mo., assignor to Leggett & Platt, Incorporated, Carghage, Mo.

Filed Jan. 16, 1984, Ser. No. 571,000

Int. Cl.[4] A47C *17/04*

U.S. Cl. 5—13 **1 Claim**



1. In a foldable sofa-sleeper bed frame adapted to be mounted upon a sofa frame having back and side members and a stationary front rail which defines a storage enclosure, said bed frame comprising pivotally interconnected head, body, intermediate and foot sections each having a pair of opposed side rails adapted to support a fabric and mattress, and a pair of center legs each connected to a center actuating arm movable to retract and extend said center legs, said bed frame being movable between a retracted position in which said bed frame is contained within said storage enclosure of said sofa frame and said center actuating arms retract said center legs, and an extended position in which said bed frame extends forwardly over said front rail and said center actuating arms extend said center legs to form a bed, the improvement comprising:

a U-shaped cross brace having opposed legs and an elongate tube connected between and extending substantially transverse to said legs, each of said legs being pivotally connected at one end to one of said side rails and having a pin at the other end;

said cross brace being pivotal from a first position in which said legs are disposed in a plane substantially transverse to said side rails and said fabric with said bed frame in an extended position, to a second position in which said legs are disposed in a plane substantially parallel to said side rails and fabric with said bed frame in a retracted position;

opposed pivoting arms formed with a slot at one end having a forward and rearward end, each of said pivoting arms being connected to one of said center actuating arms and being movable therewith, said slotted end of each of said pivoting arms receiving said pin of one of said legs of said U-shaped cross brace, said pins being movable between said forward and rearward ends of said slots with the movement of said pivoting arms as said bed frame moves from an extended position to a retracted position, said pivoting arms pivoting said U-shaped cross brace between said first and second positions.

4,571,756

FOLDAWAY HEADREST FOR CONVERTIBLE FURNITURE

Bernard Castro, 296 S. Down Rd., Lloyd Harbor, N.Y.; John Barabas, 50 Nassau Terminal Rd., New Hyde Park, N.Y. 11040, and Ralph Boccella, 906 Polk Ave., Franklin Square, N.Y. 11010

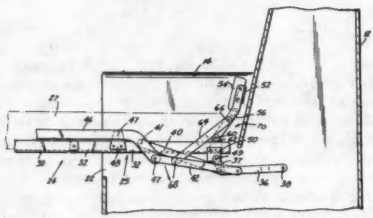
Filed May 22, 1984, Ser. No. 612,904

Int. Cl.[4] A47C *17/00*

U.S. Cl. 5—53 R **3 Claims**

1. In a convertible sofa bed having a frame, a backrest and a cavity in said frame below said backrest, a foldable bed frame adapted to support a foldable mattress and including a head section and a leg section articulated together for folding into the cavity of said froms, said head section being rigid and

having a head end portion which is adjacent said backrest when the bed is unfolded, a linkage operating mechanism for mounting said bed frame in the sofa frame and moving said frame between an extended sleep position and a folded position within said cavity wherein said head end portion of the head section is within said backrest; said linkage mechanism including first operating link pivotally connected at one end to the sofa bed frame, a swing link pivotally connected at one end to the opposite end of said first operating link and at its other end to said head section; a main operating link pivotally connected to said head section and extending therealong towards said leg section; and first and second connector links made having forward and rear ends; the forward end of the first connector link being pivotally connected to an end of said main operating link adjacent said head section and its rear end being pivotally connected to said first operating link between its ends; the forward end of the second connector link being pivotally



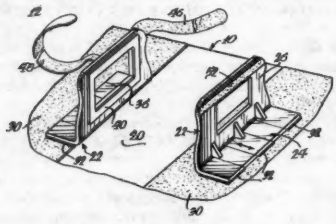
connected to said main operating link forwardly of the connection thereto of said first connector link, away from the backrest and its rear end being pivotally connected to both said first operating link and said swing link at the pivotal connection therebetween; said first connector link moving at least in pivotal rotation during movement of said head section between said first and second positions, a headboard pivotally mounted on said head section and extending across said head frame, and a head section operating link pivotally connected at opposed ends to said head board and to said first connector link at a position between its ends and forward of said swing link away from said backrest, to move said head board from a position in which it lies generally parallel to said head section in the folded position of the frame and a position generally perpendicular to the head section and in front of the backrest in said extended sleep position of the frame, in response to movement of said mobile link.

4,571,757

HEAD RESTRAINING DEVICE FOR CERVICAL SUPPORT BRACE

Donald L. Zolecki, 159th St. R.R. 6, Box 320, Lockport, Ill. 60441

Filed Jul. 10, 1984, Ser. No. 629,520
Int. Cl.[4] A61G *1/00*
U.S. Cl. 5—82 R **9 Claims**



1. For use with a cervical support board in moving an injured person strapped to the board, a head restraining device comprising the combination of:

a pair of L-shaped substantially rigid side frames each having a generally flat base portion and a brace portion angled tranversely thereto,

means for fixedly securing the base portion of each side frame to the board with brace portions then being adjacent and adjustably snugged against the sides of the injured person's head on the board,

said securing means includes having mating Velcro-type hook-loop fasteners fixed to the side frame and to the board,

strap means adapted to overlie the injuried person's head and means to secure the strap means to the brace portions of the side frames for thereby restraining the head against the board,

each of the brace portions having an opening therein operable to line up with the person's ears,

padding located on the head side of each brace portion adjacent the access opening therein operable to engage the person's head and cushion the snubbing action the brace portions have thereagainst, and

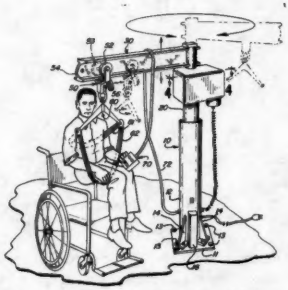
each brace portion opening being significantly larger than the person's ear operable not only to line up with the person's ears but also to provide both visual exposure of and physical access to the ear.

4,571,758

APPARATUS FOR VERTICALLY LIFTING AND RADIALLY MOVING A PERSON OVER A SUPPORTING SURFACE

Frank A. Samuelsson, Redwood City, Calif., assignor to United Air Lines, Inc., Elk Grove Township, Ill.

Filed Aug. 31, 1983, Ser. No. 528,223
Int. Cl.[4] A61G *7/10*
U.S. Cl. 5—86 **7 Claims**



1. Apparatus for vertically lifting and both radially and linearly moving a person over a supporting surface comprising:

base means for fixed attachment to a supporting surface;

a substantially hollow cylindrical support member releasably attached to said base means and extending substantially upward therefrom;

a substantially cylindrical load lifting member positioned inside said support member;

vertical motive means connected to said load lifting member for vertically moving said load lifting member relative to said support member;

an upper member connected to said load lifting member for rotation relative thereto; and having a notched opening for receiving a cantilevered load support arm; radial bearing means for connecting said upper means to said load lifting member;

a cantilevered I-beam load support arm connected to said upper member and extending radially therefrom so that

said load support arm is moveable relative to said load lifting means;

a trolley support means connected to and subtending from said support arm for linear movement along the length of said support arm;

and a harness means for holding the person connected to said trolley means.

4,571,759

BED APPARATUS WITH A URINAL

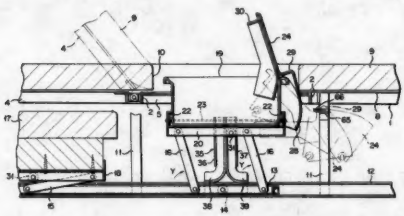
Noboru Sasaki; Teruo Mukai, and Yasuji Iwata, all of Tokyo, Japan, assignors to France Bed Co., Ltd., Tokyo, Japan

Filed Nov. 1, 1983, Ser. No. 547,761

Claims priority, application Japan, Nov. 8, 1982, 57-195555; May 10, 1983, 58-81465

Int. Cl.[4] A61G *7/02;* A47K *11/04*

U.S. Cl. 5—90 8 Claims



1. A bed apparatus, comprising:

a bed frame;

a cushion unit having an opening section and disposed on the bed frame;

a urinal having a top opening;

a cushion pad for closing the opening section of the cushion unit;

a truck capable of traveling beneath the cushion unit, above which truck the cushion pad and the urinal are arranged to be movably positioned;

rail means supported below the bed frame for carrying the truck as the truck travels between first and second positions beneath the cushion unit;

means for guiding the urinal and the cushion pad, one at a time, for movement between the truck and the opening section of the cushion unit above the truck;

means for moving the truck between the first and the second positions, so that the cushion pad is received in the opening section and the urinal is disposed beneath the cushion unit, when the truck is moved to the first position and the cushion pad is guided by the guiding means; and the cushion pad is disposed beneath the cushion unit and the urinal is at least partly located in the opening section, when the truck is moved to the second position and the urinal is guided by the guiding means;

wherein the guiding means includes a pair of guide members defining guide passages which form openings at both ends of said guide members, the openings at one end of said guide members facing the opening section of the cushion unit, and the openings at the opposite end of each of said guide members being located at the rail means and facing away from each other in opposite directions along the rail means, and wherein said guide passages receive and guide movement of parts of separate mounting units associated with the urinal and the cushion pad.

4,571,760

CARRY-COT

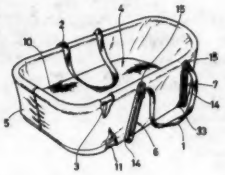
Kenzou Kassai, Osaka, Japan, assignor to Kassai Kabushikikaisha, Osaka, Japan

Filed Apr. 24, 1984, Ser. No. 603,441

Claims priority, application Japan, May 13, 1983, 58-72003[U]

Int. Cl.[4] A47C *29/00*

U.S. Cl. 5—99 R 9 Claims



1. In a box-type carry-cot having a box frame with an open top and flexible belt means (1, 2) having opposed ends connected to frame points located to surround the center of gravity of the carry-cot, so that the carry-cot can be suspended by lifting the belts, the improvement comprising an upper frame (3) forming a peripheral edge defining said open top, a lower base (4) forming a peripheral edge and disposed parallel to and below said upper frame (3) and defining a bottom wall of the carry-cot, flexible sheet means (5) stretched between said upper frame (3) and the peripheral edge of said lower base (4) for forming box side walls, a head wall and a foot wall, first, second, third and fourth link means (6, 7, 8, 9) arranged in pairs for holding said upper frame (3) and said lower base (4) so as to allow them to move toward and away from each other, each link means comprising a main support rod (14) having upper and lower ends, and an auxiliary support rod (15) also having upper and lower ends first journal means (16) for connecting said lower end of said auxiliary support rod to a lengthwise intermediate portion of said main support rod (14) so that said rods can overlap each other when the rods extend longitudinally in parallel with each other, said first and second link means (6, 7) being disposed on one side of said cot and said third and fourth link means (8, 9) being disposed on the other side of the said cot, second journal means (18) for connecting said lower ends of said individual main support rods to an outer periphery of said lower base (4) at four points surrounding the center of gravity of the carry-cot, third journal means (35) for individually connecting said upper ends of said auxiliary support rods (15) to an outer peripheral edge of said upper frame (3) so that when said individual link means (6 to 9) are respectively in the linear state, the first and second link means (6, 7) on the one hand and the third and fourth link means on the other hand are directed obliquely upwardly with their upper ends positioned closer to each other than their respective lower ends, first folding stop means (17) enabling said first and second link means (6, 7) and said third and fourth link means (8, 9) to collapse from their respective linear states only in one direction (A) in which said upper ends of said main and auxiliary support rods (14, 15) move away from each other, second folding stop means (32, 33) for limiting the cot opening movement of said individual link means when they are respectively in the linear state and for maintaining said upper frame (3) and said lower base (4) at a maximum distance from each other and substantially parallel to each other, whereby said main support rods (14) of each pair are prevented from further rotating in the direction in which they approach each other, locking means (23) for elastically engaging said main and auxiliary support rods (14, 15) of a pair with each other to maintain the main and auxiliary rods in the linear state, wherein said belt means include a first belt (1) attached with its ends to the lower ends of said main support rods of said first and second link means (6, 7) and a second belt (2) attached with its ends to the lower ends

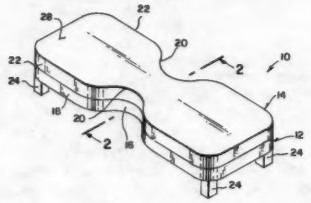
of said main support rods of said third and fourth link means (8, 9), and wherein each of said main support rods (14) comprises belt guide means (27) defining a belt receiving hole (26) substantially at the upper end of the respective main support rod, said first and second belts (1, 2) being inserted in the respective belt receiving hole for maintaining the respective belt end substantially alongside the respective main support rod.

4,571,761

CUT AWAY LOUNGE AND/OR BED

Samuel Perlin, 11 Stirrup La., Roslyn, N.Y. 11577

Filed Nov. 2, 1984, Ser. No. 667,809
Int. Cl.[4] A47C *27/12, 11/00*
U.S. Cl. 5—431 **6 Claims**



1. A cut away lounge and/or bed for providing a new and more comfortable means of copulation which comprises:

(a) a rigid one piece non-adjustable frame, substantially horizontal at least in its area other than the head portion, having two cut away areas, each said cut away area formed on an opposite side of said frame so that said frame assumes an hour glass configuration; and

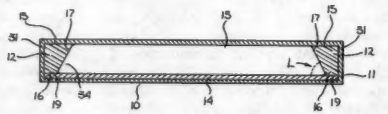
(b) a mattress, substantially horizontal at least in its area other than the head portion, having two cut away areas, each said cut away area formed on an opposite side of said mattress so that said mattress assumes an hour glass configuration, said mattress being placed upon said frame with said cut away areas in alignment, the top surface of the mattress being sufficiently vertically spaced from a supporting surface on which the frame rests so that a man can lie horizontally back on said mattress and a woman can stand on said supporting surface, vertically over said man with her thighs fitting into said cut away areas of both said frame and said mattress making closer contact possible between said man and said woman during sexual intercourse, with greater comfort to the woman.

4,571,762

HYBRID WATERBED CAVITY

Albert L. Rhoton, Cypress, and Gregory A. Ribblett, Hacienda Heights, both of Calif., assignors to Morgan Flotation Systems, Los Angeles, Calif.

Filed Jul. 24, 1984, Ser. No. 633,935
Int. Cl.[4] A47C *27/08*
U.S. Cl. 5—451 **15 Claims**



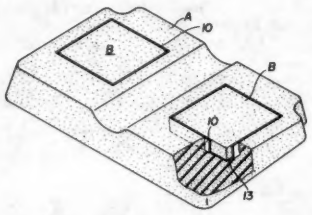
1. An improved hybrid waterbed mattress comprising four side walls formed of foam material, a base formed of soft foam material and having a top and bottom surface, the bottom surface of said side walls adhering to the base thereby supporting said sidewalls in a vertical position, a bladder for retaining water surrounded by said side walls and diposed on said base, and a cover material surrounding said mattress, side walls and base, the improvement comprising side walls having a top surface and bottom surface, said top surface being of greater width than said bottom surface, and an inclined plane surface disposed over the edge of said bladder, whereby outward deflection of the side wall under downward pressure is minimized.

4,571,763

CUSHION MEMBER FOR A VEHICLE SEAT

Tomio Suzuyama, and Akira Aoki, both of Akishima, Japan, assignors to Tachikawa Spring Co., Ltd., Japan

Filed Jun. 29, 1984, Ser. No. 626,044
Int. Cl.[4] A47C *27/14*
U.S. Cl. 5—464 **6 Claims**



1. A cushion member for a vehicle seat comprising:

a main body formed of a foamed material and defining an upper seat area upon which sitting loads are applied, said main body defining a recess subjacent to said seat area, said recess including a ceiling wall and dependently projecting peripheral walls;

a block body disposed in said recess and having an upper surface adjacent to and in contact with said ceiling wall, and side walls adjacent respective ones of said peripheral walls, said block body being formed of a softer foamed material than the foamed material of said main body;

bonding means for permanently bonding said upper surface and said ceiling wall one to another, said bonding means forming a hardened layer between said block body and said main body; and

bonding-preventing means disposed between said side and peripheral walls for preventing bonding of said side and peripheral walls one to another, wherein

said bonding means is disposed substantially perpendicular to said applied sitting loads for distributing same over said block body.

4,571,764

MULTI-PURPOSE ELECTROTECHNOLOGICAL PLIERS

Ching-Wen Chen, No. 29-1, Lu-Ti St., and Ching-Jen Chen, No. 33-1, Lu-Ti St., both of Panchiao, Taipei Hsien, Taiwan

Filed Feb. 12, 1985, Ser. No. 700,713
Int. Cl.[4] B25F *1/00;* **B25B** *7/22*
U.S. Cl. 7—107 **6 Claims**

1. An improved multi-purpose pair of pliers, comprising:

first and second body members, each having an upper end, and two opposite sides having first and second notches respectively;

first and second cover members for securing said upper and lower body members therebetween;

first and second T-shaped members respectively confined between said first cover member and said first body member, and said second cover member and said second body member, which are capable of moving relative to said first and second body members and each comprising a transverse section and a longitudinal section, with said trans-

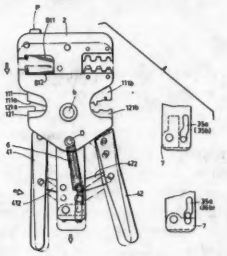
verse sections maintained above said upper ends of said first and second body members, said longitudinal sections respectively provided with a longitudinal offset guiding slot having an upper extremity, a lower extremity and a bent portion, said transverse section having a free upper side and a lower side confronting said upper ends of said body members;

a fixed tool member secured with said second body member;

a movable tool member mounted with said first body member and pivotable relative thereto about a first pivot axis passing through said first and second body members and said first and second T-shaped members, said fixed tool member and movable tool member having tooling surfaces extending across said first and second notches of said first and second body members;

a first handle bar pivoted with said second body member at a second pivot;

a second handle bar secured with said movable member;



a first link lever interconnecting said first handle bar and said T-shaped members;

a second link lever interconnecting said second handle bar and said T-shaped members, which has a first end pivoted to said second handle bar and a second end;

a sliding pin passing through said longitudinal offset guide slots for fastening said second end of said second link lever and said T-shaped members; and

a compression spring member having an end connected with said sliding pin to bias it to said upper extremity of said longitudinal offset guiding slots, the other end thereof connected with said first and second cover members, whereby when operating said first and second handle bars, said first and second T-shaped members can be moved downwards relative to said first and second body members with the movement of said sliding pin along said longitudinal offset guiding slots.

4,571,765

METHOD OF AND APPARATUS FOR THERMALLY TREATING FIBER YARNS

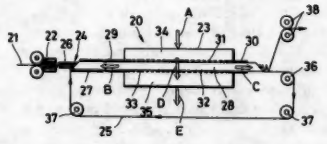
Tokio Okada; Shigezo Kojima, both of Tokyo, and Haruhisa Tani, Tokorozawa, all of Japan, assignors to Polymer Processing Research Institute, Ltd., Tokyo, Japan and The Bouligny Company, Charlotte, N.C.

Filed Aug. 7, 1984, Ser. No. 638,364

Claims priority, application Japan, Aug. 10, 1983, 58-145954

Int. Cl.[4] D06B *3/02, 23/04, 23/18*

U.S. Cl. 8—149.3 **9 Claims**



1. In the method of continuous thermal treatment of a bundle or bundles of fibers fed longitudinally in a continuous cake form corrugated in advance, said method comprising the steps of: wrapping the continuous cake of the fibers with a breathable heat resistant fabric (**25**) to form a continuous belt-like shaped object (**28**); letting the belt-like shaped object (**28**) pass through at least one thermal treatment region (**33**) filled with a heating medium having a predetermined temperature and pressure for thermally treating the fibers through pressure seal portions (**29, 30**) each having a cross section substantially the same as the cross section of the belt-like shaped object (**28**); and unwrapping the cake of the fibers (**21**) from the breathable heat resistant fabric (**25**) to take out the fibers (**21**), the improvement which comprises filling said region with a heating medium which is non-condensable gas, superheated steam, or a mixture of said non-condensable gas and superheated steam, and a pressure difference is produced between the two ends of the said pressure seal portions (**29, 30**), and between the opposite sides of the passage of the belt-like shaped object in the said thermal treatment chamber (**33**), thereby causing said heating medium to flow (a) longitudinally along the belt-like shaped object (**28**) in opposite directions or (b) transversely across the belt-like shaped object (**28**) or both according to flow (a) and (b).

2. In an apparatus (**20**) for continuous thermal treatment of a bundle or bundles of fibers (**21**) withdrawn from a stuffer box (**22**) in a continuous cake form corrugated in advance, said apparatus comprising: means (**24**) disposed downstream of the stuffer box (**22**) for wrapping the continuous cake of the fibers (**21**) with a breathable heat resistant fabric (**25**) to form a continuous belt-like shaped object (**28**) having a substantially uniform cross section throughout the length thereof; a heat-treatment chamber (**23**) disposed downstream of said wrapping means (**24**) and including a pair of parallel spaced perforated partition walls (**31, 32**) defining therebetween a guide channel (**33**) for the passage of the belt-like shaped object (**29**); means (**42, 58**) for supplying a heating medium into said heat-treatment chamber (**23**) to heat the fibers (**21**); and a pair of ducts (**29, 30**) extending outwardly from the opposite ends of said guide channel (**33**) of the heat-treatment chamber (**23**) for the passage therethrough of the belt-like shaped object (**28**), said ducts (**29,30**) having a cross section substantially the same as the cross section of the belt-like shaped object (**28**) to provide pressure seal for the purpose of limiting the quantity of flow of the heating medium out of the channel and preventing intrusion of the outside air into said heat-treatment chamber (**33**) and the first one of said ducts corresponding to the inlet duct (**29**) of said heat-treatment chamber (**33**), the improvement wherein said heat-treatment chamber (**23**) is separated by said guide channel (**33**) into high-pressure portion (**34**) and the low-pressure portion (**35**) disposed on opposite sides of said guide channel, said heating medium comprises one of non-condensable gas, superheated steam, and a mixture of said non-condensable gas and said superheated steam, passage means is disposed outside said heat-treatment chamber for recirculating the heating medium from said low-pressure portion (**35**) to said high-pressure portion (**34**) of said heat-treatment chamber (**23**), and pressurizing and heating means (**40, 41**) is disposed in said passage means for pressurizing and heating the heating medium before the heating medium is recirculated into said high-pressure portion (**34**).

4,571,766

DEVICE FOR CLEANING THE INTERIOR SURFACE OF AN AQUARIUM

Jerome N. Goldman, New York; Marvin A. Goldman, Great Neck, and Gerald A. Philips, Glen Cove, all of N.Y., assignors to Penn Plax Plastics, Inc., Garden City, N.Y.

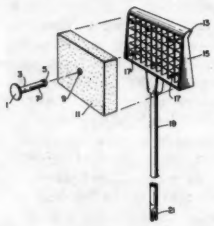
Filed Jun. 6, 1984, Ser. No. 617,879

Int. Cl.[4] A47L *1/06*

U.S. Cl. 15—105 **20 Claims**

1. A device for cleaning the interior surface of an aquarium which comprises,

(a) a headpiece,
(b) a handle attached to the headpiece,
(c) one or more cleaning elements which are removably attached to the headpiece,
(d) a means for removably attaching the cleaning element to the headpiece and,

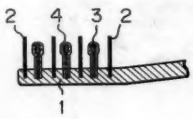


(e) a planting end piece adapted for pushing the bases and roots of aquarium plants, and aquarium air tubing under the surface of the bottom material of the aquarium, attached to the bottom end of the handle.

4,571,767
GOLF SHOE CLEAT CLEANER
Charles C. Dangler, 14620 Pebblestone Dr., Silver Spring, Md. 20904
Filed May 25, 1984, Ser. No. 614,023
Int. Cl.[4] A46B *15/00*
U.S. Cl. 15—161 **13 Claims**

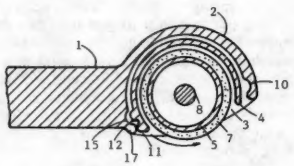
1. A golf shoe cleaner, comprising:
a rigid block;
a brush means mounted on the upper surface of said rigid block for cleaning the sole and cleats of a golf shoe;
a cleating means mounted on the bottom surface of said rigid block and adapted to be inserted in the ground for holding said rigid block substantially stationary when a golf shoe is scrubbed across said brush means;
and, an upwardly extending tubular shaft, fixedly connected to one end of said block, having a length comparable to a conventional golf club, and adapted to allow a standing golfer to hold on to the upper end of said tubular shaft while said cleating means is inserted into the ground and to scrub a golf shoe worn by the golfer across said brush means, said cleating means mounted within the horizontal extent of the brush means taken in the direction along a line toward the fixedly connected shaft end of the block, wherein said cleating means comprises at least one flat member securely affixed directly to said bottom surface of said rigid block, a face of said at least one flat member positioned parallel to the plane said tubular shaft makes with said horizontal extent of said brush means wherein said flat member is positioned perpendicular to the direction a shoe is scrubbed across said brush means.

4,571,768
TOOTHBRUSH
Yonesaburo Kawashima, Tochigi, Japan, assignor to Tochigi Seiko Co., Ltd., Tochigi, Japan
Filed Aug. 14, 1984, Ser. No. 640,688
Claims priority, application Japan, Aug. 19, 1983, 58-127310[U]
Int. Cl.[4] A46B *9/04*
U.S. Cl. 15—167 R **2 Claims**



1. In a toothbrush having a plurality of bristles supported on a bristle supporting portion of the toothbrush, at least one resilient projecting element being supported on the bristle supporting portion with the height thereof being somewhat lower than that of the bristles, a permanent magnet being encapsulated in the tip end portion of the projecting element, said projecting element comprising a hollow synthetic resin tube supporting the permanent magnet at the tip thereof, and an elongated synthetic resin piece having a hardness greater than the hardness of the synthetic resin tube and disposed inside the tube at the base thereof.

4,571,769
COMPACT PERSONAL ROLLER
Thomas M. Ford, 7669 Westover Ct., Fair Oaks, Calif. 95628
Filed May 18, 1984, Ser. No. 611,712
Int. Cl.[4] B05C *17/02*
U.S. Cl. 15—230.11 **6 Claims**



1. A roller device for the application of liquids upon the human skin comprising:
a holder for a roller, a cylindrical roller rotatably supported in the holder, and an arcuate cover for the roller, wherein
the holder comprises a partially cylindrical member having a distal edge and a proximal, edge defining an open portion along one side thereof, said holder having spaced closed ends, and having a detent recess on each of the proximal and distal edges;
the cylindrical roller's outer surface having a covering of a liquid absorbing material which is capable of releasing a liquid stored therein temporarily, upon the application of pressure upon said covering;
the arcuate cover being a partially cylindrical member, larger than said roller, rotatably mounted about a common rotational coaxial axis with said roller, and being interposed between said holder and said roller;
said cover having a pair of closely spaced first and second bosses adjacent the same edge of the partial cylindrical

member, each boss being disposed inwardly from that edge a different distance, and each of which bosses is adapted to engage a different one of the detent recesses of said holder;

said cover being movable from a first position to a second position, the first position being internal between the cover and the roller thereby permitting usage of the roller; the second position being external of the holder and covering the roller thereby denying access to said roller,

whereby when said cover is in the first position, one of said bosses engages a detent recess on the proximal edge of said holder, and when said cover is in the second position, the other of said bosses engages a detent recess on the distal edge of said holder.

4,571,770

WINDSHIELD WIPER DEVICE FOR MOTOR VEHICLES

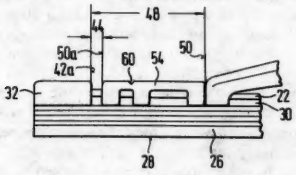
Peter Kessler, Sasbach, and Jürgen Mayer, Gaggenau, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Oct. 9, 1984, Ser. No. 658,615

Claims priority, application Fed. Rep. of Germany, Nov. 9, 1983, 3340404

Int. Cl.[4] B60S *1/02, 1/38*

U.S. Cl. 15—250.42 **7 Claims**



1. A wiper device for windshields of motor vehicles, comprising an elongated wiper blade driven in a direction transverse to the direction of the elongation of the blade and including a blade-carrying support having at least two pairs of claws spaced from each other in said direction of elongation, an elongated wiper element including a rail receiving said claws and held thereby, and a wiper lip connected to said rail and adapted to lie against a surface of a windshield pane to be wiped off, said wiper element being longitudinally diplaceable relative to said support and having stops at two ends thereof, said claw pairs having stop shoulders cooperating with the stops of the wiper element to limit a displaceability of said wiper element relative to said support, and at least one spacer positioned between at least one stop and a respective stop shoulder to reduce the displaceability of said wiper element relative to said support, said wiper element being provided with opposite grooves extended in said direction of elongation, said claw pairs being engaged in said opposite grooves, said spacer having projections insertable in the grooves of the wiper element, said wiper element having a side facing toward said support, said spacer overlapping said wiper element at said side, said spacer being formed with at least two pairs of said projections spaced from each other in the direction of elongation of said wiper element, said spacer having breaking point-means extended in the direction transversal to the direction of elongation of said wiper element, whereby said spacer can be broken and thereby adjusted to blade-carrying supports of various lengths.

4,571,771

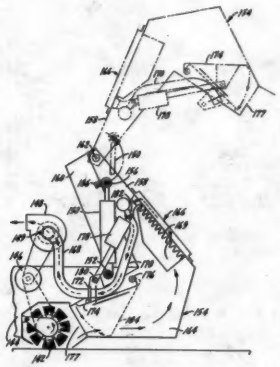
SWEEPER WITH FIRE CONTROL

Richard G. Worwa, Robbinsdale, Minn., assignor to Tennant Company, Minneapolis, Minn.

Filed Aug. 27, 1984, Ser. No. 644,615

Int. Cl.[4] A47L *11/24*

U.S. Cl. 15—319 **17 Claims**



1. In a sweeper, a frame, a debris hopper on the frame with an opening for receiving debris, an air exhaust system connected to the hopper including a vacuum fan for exhausting air from the hopper, a power source on the frame for operating the vacuum fan, means for sensing the temperature of the air flowing through the air exhaust system from the hopper, and means responsive to the temperature sensing means in the air exhaust system for indicating when the air temperature in the air exhaust system has reached a predetermined level.

4,571,772

UPRIGHT VACUUM CLEANING APPLIANCE

James Dyson, Bathford, England, assignor to Prototypes, Ltd., Bath, England

Continuation-in-part of Ser. No. 452,917, Dec. 27, 1982, abandoned, and a continuation-in-part of Ser. No. 627,110, Jul. 2, 1984, abandoned, and a continuation-in-part of Ser. No. 627,292, Jul. 2, 1984, and a continuation-in-part of Ser. No. 628,346, Jul. 6, 1984. This application Sep. 28, 1984, Ser. No. 655,148

Int. Cl.[4] A47L *9/16, 5/32*

U.S. Cl. 15—335 **20 Claims**

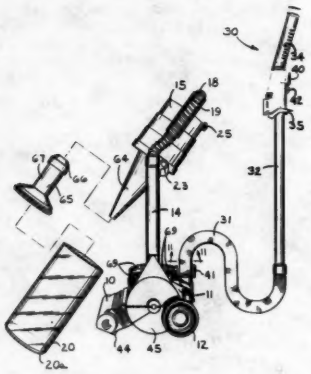
1. In an upright vacuum cleaning appliance for cleaning floors having a casing with a floor engaging cleaner head and an upright dirt collection container which retains dirt picked up by the cleaning head inside the collection container and a handle for moving the appliance along the floor, the improvement which comprises:

(a) said container having an open top and a closed bottom supported on the bottom by said casing and having a longitudinal axis between the top and the bottom;

(b) a pair of spaced apart pipes mounted on the casing and spaced from the longitudinal axis of and adjacent to the container and in air flow connection with the casing;

(c) an air flow control cap mounted on the open top of the container for directing the flow of dirt laden air into said

container, said cap being pivotably supported by and in a flow connection with said pipes, said container being held



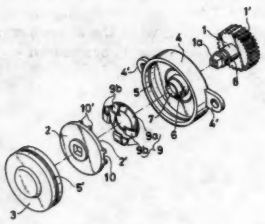
in place between said cap and said casing and being removable when said cap is pivoted, for removal of dirt.

4,571,773

DAMPER FOR BRAKING ROTATION

Takuo Yuda, Yokohama, Japan, assignor to Nifco Inc., Yokohama, Japan

Filed Jun. 8, 1984, Ser. No. 618,700
Int. Cl.[4] E05F *5/08*
U.S. Cl. 16—85 **3 Claims**



1. A rotation-braking damper, comprising:
a cylindrical housing consisting of a cap at one end provided at the center thereof with an aperture, a fitting piece and a case adapted to be fitted into said cap;
a shaft insertable into said aperture having shoulder means along its length for cooperation with said fitting piece and being rotatable within said fitting piece;
a non-rotatable disk fastened to the leading end of said shaft on a radial plane to the axis of said shaft and inserted home into said housing; and
a spring means for biasing said disk in an axial direction against the other end of said housing to provide braking of said shaft.

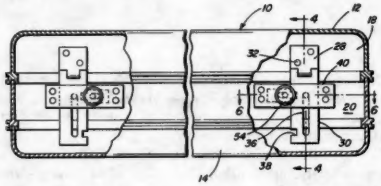
4,571,774

ATTACHE-PODIUM

Eulit M. Hinson, 218 Shangri-La Ave., Brunswick, Ga. 31520

Filed May 8, 1984, Ser. No. 608,169
Int. Cl.[4] E05D *7/04*
U.S. Cl. 16—237 **2 Claims**

1. An adjustable hinge assembly, said hinge assembly including a pair of hinge leaves pivotally joined together for relative angular displacement about a predetermined axis of oscillation, one of said hinge leaves being elongated in a direction extending generally radially of said axis and being in the form of a plate member whose medial plane parallels said axis, the other of said hinge leaves including means for anchoring said other hinge leaf to a first object, a housing, said housing including means for attaching said housing to a second object relative to which said first object is to be pivotally mounted, said housing including a rectangular cross section through passage extending therethrough, said one hinge leaf being slidingly and guidingly received through said passage, said housing including a combined guide and limit pin extending centrally and transversely across the minor width dimension of said passage centrally intermediate the opposite ends thereof, said one hinge leaf including a central longitudinally extending closed ended slot formed therein through which said pin is slidingly and guidingly received with the closed ends of said slot defining abutments engageable with opposite sides of said pin defining limit positions of longitudinal shifting of said one hinge leaf



relative to said housing in opposite directions, said housing being elongated in a direction transverse to the direction in which said passage extends, one longitudinal side edge of said one hinge leaf including a pair of longitudinally spaced edgewise outwardly opening notches formed therein, an internal latch member guidingly reciprocally mounted within said housing on one side of said one hinge leaf for linear shifting toward and away from the latter and including a tongue projecting toward the longitudinal edge of said leaf in which said notches are formed and with which the latter are registered when said one hinge leaf is in its limit positions of shifting relative to said housing, spring means disposed within said housing yieldingly biasing said latch toward said one longitudinal side edge or keyed engagement of said tongue within one said notches, said latch including a clamping and operating knob threadedly mounted therefrom, disposed externally of said housing and operative to selectively releasably clamp said latch in adjusted shifted position relative to said housing.

4,571,775

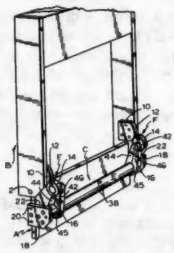
COUNTERBALANCE DEVICE AND TORSION MEMBER USABLE THEREIN

George H. Leonard, Darien, Conn., assignor to Airpot Corporation, Norwalk, Conn.

Continuation of Ser. No. 477,337, Mar. 21, 1983, abandoned.
This application Mar. 18, 1985, Ser. No. 712,757
Int. Cl.[4] E05F *1/10*
U.S. Cl. 16—298 **23 Claims**

1. A counterbalance device to act between first and second parts connected to one another to pivot about a first axis, comprising a pair of spaced supports adapted to be secured to said first part and spaced from one another along a second axis spaced from said first axis, socket members secured to said supports, extending toward one another, and having polygonal recesses facing one another along said second axis, a torsion member having ends non-rotatably received in said recesses and extending along said second axis, a sleeve extending between and mounted on said socket members to rotate relative to said socket members about said second axis, said torsion member being freely received within said sleeve, an anchor

means inside said sleeve non-rotatably mounted on said torsion member at a point spaced from said socket members, and



means operatively connecting said anchor means to said second part.

4,571,776

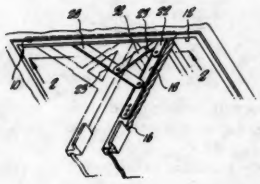
RELEASABLE WINDOW HINGE

George A. Taylor, La Crescenta, Calif., assignor to A. W. Anderberg Manufacturing Co., Los Angeles, Calif.

Filed Apr. 17, 1984, Ser. No. 601,384

Int. Cl.[4] E05D *11/08, 15/00*

U.S. Cl. 16—339 **3 Claims**



1. A releasable window hinge, comprising, a rail with a stop formed near one end, a first slider moveable along said rail and retained near said one end of said rail by said stop in said rail, a thrust link, a brace, means pivotally connecting one end of said thrust link and one end of said brace to said slider, a window mounting bracket pivotally connected to the other end of said thrust link, a second slider moveable along said rail, a strut pivotally connected to said second slider, means pivotally connecting the other end of said brace to said strut, means pivotally connecting the other end of said strut to said mounting bracket, and releasable means to maintain the normal position of said first slider at said one end of said rail and when said releasable means are released to allow movement of both said sliders, said thrust link, said brace and said window mounting bracket relative to said rail without pivoting.

4,571,777

APPARATUS FOR AUTOMATICALLY STUNNING ANIMALS TO BE SLAUGHTERED

Johan W. Nijhuis, Winterswijk, Netherlands, assignor to Machinefabriek G.J. Nijhuis B.V., Netherlands

Filed May 8, 1980, Ser. No. 147,826

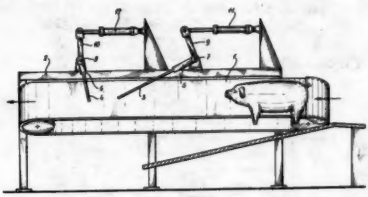
Int. Cl.[4] A22B *3/00*

U.S. Cl. 17—1 E **3 Claims**

1. An apparatus for automatically stunning animals to be slaughtered comprising:

a conveyor including two endless conveyor means, said conveyor means having operating surfaces facing each other, said operating surfaces forming a substantially V-shaped passageway therebetween; and

first and second electrodes, said electrodes being operable to pivot about a horizontal shaft, and being adapted to extend downwardly toward said V-shaped passageway, each electrode being further adapted to be kept in its initial position by resilient means, said resilient means being



provided with a damper adapted to dampen at least the upward movement of each said electrode to bring the electrode to rest with minimum oscillation.

4,571,778

DEVICE FOR THE AUTOMATIC SUPPLYING OF FISH TO FISH PROCESSING MACHINES

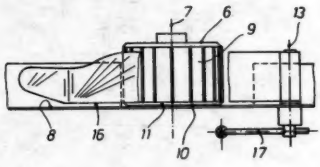
Axel W. Sawusch, 1860 Trögstad (Bilverlested), Norway, and Günther Pinkerneil, II. Ochsenkoppel 7a, 2400 Lübeck, Fed. Rep. of Germany

Filed Feb. 27, 1984, Ser. No. 583,612

Claims priority, application Fed. Rep. of Germany, Mar. 2, 1983, 3307258

Int. Cl.[4] A22C *25/08*

U.S. Cl. 17—54 **12 Claims**



1. A device for the automatic supplying of fish having a head end, a back and a belly to a fish processing machine, said device comprising:

a belly-back aligning section for aligning said fish in uniform belly-back position as well as for transferring said fish thus aligned to said processing machine in timed cycles of successive pulses,

said aligning section comprising an aligning path including guide channel means, toothed roller means having a circumferential surface and resiliently-yielding guiding surface means disposed opposite said toothed roller means and forming a gap therebetween,

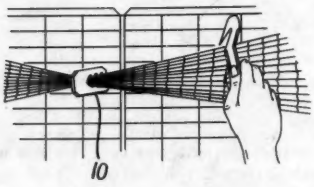
said guide channel means being arranged to receive said fish singly in said successive pulses with said head end leading and to guide said received fish to said gap, and

control means operable in timed sequence for automatically moving said guiding surface means away from said circumferential surface at predetermined intervals, whereby to increase the size of said gap sufficiently to release any fish jammed in said guide channel means.

4,571,779
TIE-OFF CLOSURE FOR NETTING PRODUCTS

Lou Anne Koerschner, White Bear Lake; Robert C. Sloumb, Shoreview, and William E. Weber, Vadnais Heights, all of Minn., assignors to Conwed Corporation, St. Paul, Minn.

Filed May 2, 1983, Ser. No. 491,179
Int. Cl.[4] B65D 77/10; A44B 21/00
U.S. Cl. 24—30.5 S 7 Claims

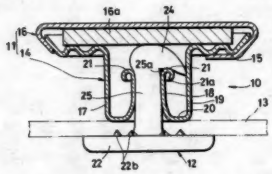


1. A closure clip for plastic netting which comprises a relatively stiff plastic strip of a material compatible with the plastic netting for recycling purposes, said plastic strip having a slot therein opening at one end of said strip, said slot having a plurality of parallelly disposed branching slits extending therefrom, said slits being operative to receive strands of plastic netting therethrough and to hold the joints of said netting against passage therethrough.

4,571,780
BUTTON HAVING ATTACHMENT TACK DEFORMED BY ANVIL

Takeo Fukuroi, Uozu, Japan, assignor to Nippon Notion Kogyo Co., Ltd., Tokyo, Japan

Filed Apr. 13, 1984, Ser. No. 600,019
Claims priority, application Japan, Apr. 13, 1983, 58-55047[U]; Dec. 29, 1983, 58-199963[U]
Int. Cl.[4] A44B 1/42
U.S. Cl. 24—95 6 Claims

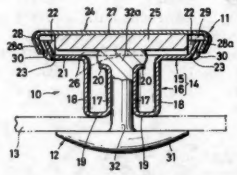


1. A button for attachment to a garment fabric, comprising:
(a) a button body including a button back, a cap covering said button back on its obverse side, and a back plate disposed between said button back and said cap, said button back having a hollow hub disposed remotely from said cap and extending axially of said button back, said hollow hub having a pair of concentric inner and outer tubes joined at one end thereof, said inner tube having an outwardly curled annular flange projecting outwardly from the other end of said inner tube and terminating in an edge between said tubes and which defines a circle of a diameter smaller than the maximum outside diameter of said curled annular flange;
(b) a tack member including a head, and a shank projecting perpendicularly and centrally from said head for piercing through the garment fabric and then being inserted into said hollow hub of said button back to thereby join said tack member with said button body; and
(c) said shank including a stem portion of circular cross section and a tapering end portion, said shank having a cold-pressed recess adjacent to a border between said stem portion and said tapering end portion, said recess of said shank being disposed in such a position that said recess is disposed adjacent to said curled annular flange of said hollow hub of said button back when said shank is fully inserted through said hollow hub with the garment fabric sandwiched between said tack member's head and said hollow hub, said tapering end portion having a distal end disposed off the axis of said shank toward said recess, said tapering end portion being bendable about said recess as said distal end is forced against said back plate during the insertion of said shank into said hollow hub of said button back.

4,571,781
DRAINABLE BUTTON ASSEMBLY

Yoshihiro Kanzaka, Nyuzen, and Masahiko Ito, Funabashi, both of Japan, assignors to Nippon Notion Kogyo Co., Ltd., Tokyo, Japan

Filed Sep. 23, 1983, Ser. No. 535,080
Claims priority, application Japan, Sep. 25, 1982, 57-144884[U]
Int. Cl.[4] A44B 1/42
U.S. Cl. 24—95 3 Claims



1. A button assembly adapted to drain any liquid therefrom when attached to a garment fabric, said button assembly comprising:
(a) a button body including a button back and a cap covering said button back on its one obverse side, said button back having an annular head and a hollow stem disposed remotely from said cap and projecting from an inner edge of said annular head, said annular head having an inclined outer peripheral portion extending radially outwardly and axially of said annular head, said cap having an annular rim secured to said inclined outer peripheral portion, said annular head having a central flange portion extending between said inclined outer peripheral portion and said inner edge of said annular head, and including a backplate disposed between said flange portion and said cap and having one surface lying in a plane extending above the plane defined by an edge of said inclined outer peripheral portion of said annular head;
(b) a tack member including a head and a shank projecting perpendicularly and centrally from said head for being pierced through the garment fabric and then inserted into said hollow stem of said button back to thereby join said tack member with said button body, said button body and said tack member as joined together defining therebetween a hollow interior in said button assembly;
(c) means for draining a liquid from said hollow interior of said button assembly, said draining means including at least one channel extending between said inclined outer peripheral portion of said annular head and said annular rim of said cap and communicating at opposite ends with said hollow interior of said assembly and the atmosphere; and
(d) said backplate having at least one radially extending slot provided in the surface opposite said one surface and forming part of said draining means, said slot opening away from said cap and held in communication with said channel.

4,571,782
FASTENING MEANS FOR A BOOTLACE

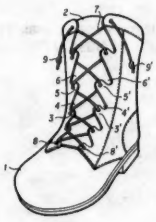
Yu H. Ahn, 481, Hyomock-dong, Dong-ku, Taequ-shi, Rep. of Korea

Filed Apr. 22, 1982, Ser. No. 370,671

Claims priority, application Rep. of Korea, Nov. 20, 1981, 7873/81[U]

Int. Cl.⁴ A43B *11/00*

U.S. Cl. 24—141 **1 Claim**



1. A fastening means for the lace of a boot, comprising:

first and second upright side edges located on said boot, provided at a cut-open portion of said boot so as to face one another, wherein said edges further comprise a plurality of alternate upwardly projecting teeth having notches formed therebetween, each of said teeth having an eyelet and a portion projecting upwardly running diagonally toward an eyelet formed in a tooth positioned opposite and upward therefrom, each of said teeth and said notches increasing in width and height in series upwardly and equally on said first and second side, wherein a spacing between adjacent eyelets on each of said first and second sides is continuously increased in an upward direction for minimizing the required number of eyelets and for minimizing friction and wherein the lowermost spacing is smaller than the uppermost spacing and wherein the height of said teeth on said first and second sides increases from a lowermost tooth to an uppermost tooth.

4,571,783
ADJUSTABLE STRAP FASTENER

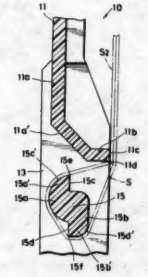
Kazumi Kasai, Namerikawa, Japan, assignor to Nippon Notion Kogyo Co., Ltd., Tokyo, Japan

Filed Dec. 28, 1984, Ser. No. 687,583

Claims priority, application Japan, Dec. 20, 1983, 58-199964[U]; Feb. 25, 1984, 59-26140[U]

Int. Cl.⁴ A44B *11/04*

U.S. Cl. 24—200 **8 Claims**



1. A strap fastener molded of synthetic resin for adjustably connecting ends of a strap or the like, comprising:

(a) a grip head portion;

(b) a pair of parallel spaced side flange portions extending from said grip head portion in a common direction and having respective bottom surfaces;

(c) a connecting portion extending perpendicularly to said side flange portions and interconnecting them at their distal ends;

(d) a pair of parallel spaced first and second cross bars extending parallel to said connecting portion and joined with said side flange portions, said first cross bar being disposed adjacent to said grip head portion;

(e) said grip head portion having a first sharp corner edge disposed adjacent to said first cross bar and lying flush with said bottom surfaces of said side flange portions; and

(f) said first cross bar including a pair of integral top and bottom portions displaced from one another in a direction parallel to said side flanges, said top portion having a first projection extending toward said grip head portion and terminating in a second sharp corner edge, said bottom portion having a second projection extending toward said connecting portion and terminating in a third sharp corner edge, said first projection having a top surface and a flat bottom surface merging together to jointly define said second sharp corner edge, said second projection having a flat top surface and a bottom surface merging together to jointly define said third sharp corner edge, said flat bottom surface and said flat top surface of said first cross bar lying in a plane extending parallel to the general plane of said strap fastener and substantially containing the longitudinal central axis of said first cross bar, said first and second sharp corner edges in plan view being spaced from one another by a distance larger than the thickness of the strap or the like.

4,571,784
SEPARABLE BOTTOM-END-STOP ASSEMBLY FOR SEPARABLE SLIDE FASTENER

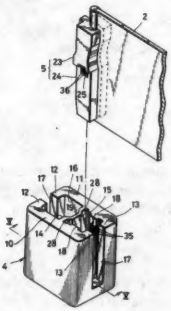
Fumio Okazaki, Kurobe, Japan, assignor to Yoshida Kogyo K. K., Tokyo, Japan

Filed Feb. 1, 1984, Ser. No. 575,862

Claims priority, application Japan, Aug. 3, 1983, 58-120982[U]

Int. Cl.⁴ A44B *19/00*

U.S. Cl. 24—433 **6 Claims**



1. A separable bottom-end-stop assembly for a separable slide fastener including a pair of fastener stringers, each including a stringer tape carrying on its inner longitudinal margin a row of coupling elements, the inner tape-margin having a bottom end portion devoid of coupling elements, said assembly comprising:

(a) a first pin member of thermoplastic synthetic resin adapted to be secured to the bottom end portion of the inner tape-margin of one stringer, said first pin member having in opposite faces a pair of recesses;

(b) a second pin member of thermoplastic synthetic resin

adapted to be secured to the bottom end portion of the inner tape-margin of the other stringer;

(c) a socket member of thermoplastic synthetic resin adapted to be united with said first pin member and having a pair of flanged wings joined by a partition wall to define between said wings a first and a second bore for receiving a portion of said first pin member and a portion of said second pin member, respectively, said partition wall having a central bulge swelling into said first bore for resiliently pressing said first pin member, when the latter is inserted into said first bore, against said wings' flanges that partly define said first bore, each of said wings having on its inner face a projection adapted to be received in a respective one of said recesses in said first pin member when said socket member is secured to said first pin member; and

(d) each of said wings having on its inner face a plurality of parallel longitudinal guide ridges facing said first bore for being slidably engageable with a respective one of the opposite faces of said first pin member while the latter is inserted into said first bore, said guide ridges being adapted to be melted and fused with said first pin member when said socket member is secured to said first pin member by applying heat and pressure.

4,571,785

SEPARABLE BOTTOM-END-STOP ASSEMBLY FOR SEPARABLE SLIDE FASTENER

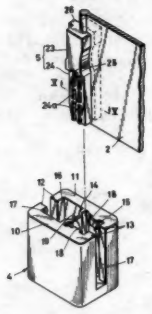
Shunji Akashi, Kurobe, Japan, assignor to Yoshida Kogyo K.K., Tokyo, Japan

Filed Feb. 1, 1984, Ser. No. 575,863

Claims priority, application Japan, Feb. 2, 1983, 58-13834

Int. Cl.[4] A44B *19/00*

U.S. Cl. 24—433 **4 Claims**



1. A separable bottom-end-stop assembly for a separable slide fastener including a pair of fastener stringers, each including a stringer tape carrying on its inner longitudinal margin a row of coupling elements, the inner tape-margin having a bottom end portion devoid of coupling elements, said assembly comprising:

(a) a first pin member of thermoplastic synthetic resin adapted to be secured to the bottom end portion of the inner tape-margin of one stringer;

(b) a second pin member of thermoplastic synthetic resin adapted to be secured to the bottom end portion of the inner tape-margin of the other stringer;

(c) a socket member of thermoplastic synthetic resin secured to said first pin member and having a pair of flanged wings joined by a partition wall to define a first and a second bore between said wings, said first bore receiving a portion of said first pin member, said second bore being receptive of a portion of said second pin member, said partition wall having a central bulge swelling into said first bore to resiliently press said first pin member against said wings' flanges that partly define said first bore; and

(d) one of said first pin member and said socket member having a pair of recesses, the other of said first pin member and said socket member having a pair of projections each received in a respective one of said recesses.

4,571,786

CHANGE-SPEED MANEUVERING APPARATUS INCORPORATED IN A VEHICLE

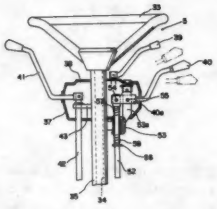
Masahide Osujo, Sennan, Japan, assignor to Kubota, Ltd., Japan

Filed Oct. 18, 1983, Ser. No. 543,097

Claims priority, application Japan, Jun. 15, 1983, 58-92446

Int. Cl.[4] G05G *11/00*

U.S. Cl. 74—485 **10 Claims**



1. A change-speed maneuvering apparatus for a vehicle having an upright steering-wheel apparatus and a change-speed apparatus, comprising:

a change-speed maneuvering shaft means arranged on one lateral side of and along said steering-wheel apparatus;

an actuation shaft means arranged on the other lateral side of and along said steering-wheel apparatus; and

interlocking means for operatively connecting said change-speed maneuvering shaft means with the change-speed apparatus, said interlocking means including lever means supported on said actuation shaft means for relative rotation with respect thereto.

4,571,787

TYING DEVICE

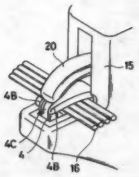
Akira Furutsu, Tokyo, Japan, assignor to Japan Bano'k Co., Ltd., Tokyo, Japan and Ben Clements & Sons, Inc., South Hackensack, N.J.

Filed Aug. 20, 1984, Ser. No. 642,473

Claims priority, application Japan, Dec. 24, 1983, 58-204724[U]; May 4, 1984, 59-64756[U]

Int. Cl.[4] B65D *63/00*

U.S. Cl. 24—543 **7 Claims**



1. A tying device integrally formed of synthetic resin and adapted to be closed by a tying maching having a bending member comprising a member having a thin portion and first and second thick portions extending respectively from opposite sides of said thin portion, said first thick portion having a first engaging portion of an essentially L-shaped cross-section, said second thick portion including a corresponding second engaging portion having an engaging hole formed therein and adapted to receive said first engaging portion to close said tying device, said first thick portion including first and second

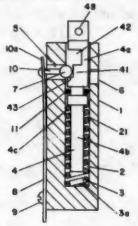
guide portions which extend off the end of said first thick portion respectively on opposite sides of said first engaging portion, said guide portions acting to prevent said first thick portion from sliding off of said bending member of said tying machine when said tying device is being closed by said tying machine, said guide portions extending on opposite sides of said second engaging member but not in said engaging hole when said device is closed.

4,571,788

DOUBLE ACTION PRESSURE RELEASE

Craig V. Bruengger, Scituate, Mass., assignor to Hazeltine Corporation, Commack, N.Y.

Filed Nov. 21, 1983, Ser. No. 553,892
Int. Cl.[4] A44B *11/25*
U.S. Cl. 24—602 **2 Claims**



1. A pressure responsive apparatus for use in a fluid medium, said apparatus comprising:

(a) a housing with a chamber, said chamber open at one end and closed at the other end;

(b) a first member located in the chamber;

(c) sealing means between said member and said housing for defining a sealed portion of the chamber;

(d) retainer means supported by the housing and engaging the first member for preventing the first member from moving out of the chamber while allowing the first member to move further into the chamber, said retainer means permitting disengagement of the first member from the housing when the apparatus reaches a first depth in the fluid medium;

(e) ejecting means for ejecting the first member when the apparatus reaches a second depth in the fluid medium, said ejecting means including first means associated with said chamber for equalizing the fluid pressure in the sealed chamber when the apparatus reaches the second depth and resilient means between one end of said member and one end of the chamber for forcing the first member out of the chamber when the fluid pressure in the sealed chamber is equalized.

4,571,789

SNAP FASTENER FOR BELT DRIVEN CARTRIDGE

Eddie T. Morioka, Roseville, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jul. 3, 1984, Ser. No. 627,355
Int. Cl.[4] F16B *21/06*; G03B *1/04*
U.S. Cl. 24—625 **3 Claims**

1. A belt driven magnetic tape cartridge housing, comprising:

a rigid, one-piece, flat base including two opposed major surfaces and a plurality of walls extending from one major surface to the other to define circular holes having a reduced diameter adjacent said one major surface;

a resilient cover including a flat top wall having an inner surface spaced from and facing said one major surface of said flat base, two opposed side walls depending from said top wall to contact said one major surface of said base, opposed front and back walls depending from said top wall to contact said one major surface of said base, and a plurality of snap fasteners equal in number to said circular holes and extending from said cover inner surface and adapted to engage said walls defining said circular holes and releasably secure said cover to said base, each of said snap fasteners including:

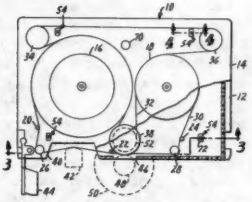
a solid body portion attached to said top wall inner surface;

a bifurcation defined by slot;

two spring arms extending from said bifurcation toward said one major surface of said base and one of said holes, said spring arms being capable of resilient deflection toward each other within said slot and being substantially perpendicular to said top wall inner surface and said one major surface of said base when undeflected;

said arms terminating in enlarged heads for insertion through said hole, which heads have a dimension parallel to said slot which is equal to or less than said hole, a combined dimension transverse to said slot when said arms are undeflected which is greater than that of said hole, and a combined dimension transverse to said slot when said arms are deflected toward each other which is less than that of said hole; and

reduced neck portions on each arm adjacent said heads which have a dimension parallel to said slot which is less than or equal to that of said hole to allow insertion



of said neck portions into said hole, and a combined dimension transverse to said slot which is substantially equal to that of said hole when said spring arms are undeflected; said spring arms further include shoulders which have a dimension parallel to said slot or a combined dimension transverse to said slot when said spring arms are deflected which is greater than that of said wall defining said hole to limit insertion of said spring arms into said hole;

wherein contact between said enlarged heads and said hole causes deflection of said spring arms toward each other which allows passage of said heads through said hole and wherein passage of said heads through said hole permits the resilient return of said spring arms to said undeflected position and contact between said neck portions and said hole whereby said snap fastener is retained in said hole by expansion of said enlarged heads to a dimension greater than said hole; and

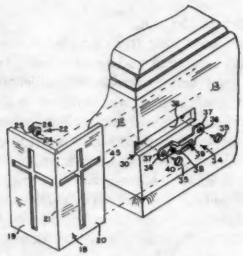
wherein the length of said spring arms is sufficient to provide lateral resiliency capable of accommodating differential expansion of said cover relative to said base so that said cover may expand in the plane of said top wall to an unequal extent as compared to expansion of said base in the plane of said base without causing deflection of said cover or said base from their flat configuration.

4,571,790

CASKET WITH ATTACHABLE CORNERS

Jasper T. James, III, Sumter, S.C., assignor to Sumter Casket Company, Sumter, S.C.

Filed Aug. 29, 1983, Ser. No. 526,985
Int. Cl.[4] A61G *17/00*
U.S. Cl. 27—10 **6 Claims**



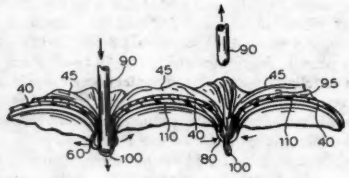
3. A casket having at least two walls joined at adjacent edges to form a corner having exterior surfaces oriented at an angle; a decorative corner plate having two panels joined at their adjacent edges at an angle corresponding to the angle of the corner of said casket and having surfaces shaped to fit snugly about said corner; a projection extending from one of said corner plate panels having a shank with a head on the shank end spaced from said panel, and a clip mounted to one of said corner walls of said casket having an aperture of a size to receive said projection head therethrough from which aperture a slot extends away from said corner edge along which said projection shank may be slid with said projection head captured thereby to slide said one corner plate panel adjacent said one corner wall and to bring the other corner plate panel into abutment with the other corner wall, the slot of said clip being sized and shaped to draw the surface of said one corner plate panel toward said one corner wall as the other corner plate panel moves into abutment with the other corner wall so that said one corner plate panel is wedged against said one corner wall and the other corner plate panel abuts the other corner wall and tends to hold the corner plate in an upright attitude on the casket.

4,571,791

TUFTED UPHOLSTERY FOR CASKET PANELS AND A METHOD OF MAKING THE SAME

Joseph P. Ceresko, Lake Ariel, Pa., assignor to Space Age Plastic Inc., Lake Ariel, Pa.

Filed Feb. 4, 1983, Ser. No. 463,738
Int. Cl.[4] A61G *17/00*
U.S. Cl. 27—19 **5 Claims**



1. An upholstery for a panel comprising: a relatively rigid sheet formed into a pattern and having attachment means for attaching fabric thereto, said attaching means being an integral part of said sheet and comprising a plurality of cuts in said sheet, said sheet being formed into concave surfaces separated by depressions, said depressions including said cuts; and

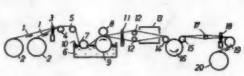
a fabric attached to said sheet by said attaching means in a manner to conform to said patterns, portions of said fabric extending through said cuts and being engaged by adjacent surfaces of said sheet defining said cuts when said portions are inserted into and through said cuts whereby the fabric is attached to said sheet by surface interengagement of the portions of the fabric with the adjacent surfaces of cuts of the sheet.

4,571,792

METHOD OF TREATING WARP YARN ENDS IN A SIZING PROCESS

Tokuji Komatsu, Kanazawa, Japan, assignor to Tsudakoma Corp., Ishikawa, Japan

Filed May 11, 1984, Ser. No. 609,256
Claims priority, application Japan, May 16, 1983, 58-085653
Int. Cl.[4] D02H *5/02*
U.S. Cl. 28—180 **4 Claims**



1. A method of treating warp yarn ends in a sizing process, in which warp yarns are sized at a low warp density, threaded through a reed, and then wound on a takeup beam in a width substantially equal to the reeding width in a loom, and in which a selected plurality of takeup beams as required to provide a total number of warp yarns are prepared and arranged in tandem relation for rewinding the warp yarns from the plurality of takeup beams onto a single let-off beam, wherein the improvement comprises the steps of threading the sized warp yarns through the reed with at least two warp yarns in each reed dent, displacing said reed transversely of said warp yarns to gather said at least two warp yarns in each reed dent into a seeming single strand at the end of the sizing step, inserting a lease thread between vertically separated sheets of the warp yarns prior to winding thereof on a single said takeup beam, applying an adhesive tape to ends of the warp yarns, and inserting a spacer in place of said lease thread while rewinding the warp yarns from each of said takeup beams onto the single let-off beam for thereby keeping the warp yarns divided as vertically separated sheets so that the warp yarns unwound from each said takeup beam will appear as if unwound from at least two beams.

4,571,793

AIR JET TEXTURING SYSTEM FOR THE PRODUCTION OF UNIFORM TEXTURED YARN

Samuel T. Price, Homosassa, Fla., assignor to Enterprise Machine and Development Corp., Wilmington, Del.

Division of Ser. No. 471,239, Mar. 2, 1983. This application Aug. 2, 1984, Ser. No. 637,126
Int. Cl.[4] D02G *1/16*; D02J *1/14*
U.S. Cl. 28—220 **14 Claims**

1. A process for the production of highly resilient textured continuous filament yarn comprising:

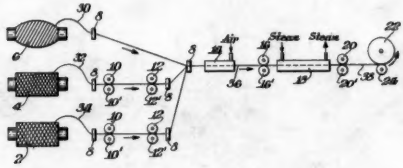
feeding at least one end of a continuous filament, at least

partially oriented synthetic polymeric feed yarn to and through a feed roll system and thence to and through a draw roll system whereby the feed yarn is drawn,

conducting said drawn yarn to a texturing air jet system,

conducting said yarn end through said jet, thereby forming multiple random loops in the yarn end including a proportion of random unstable loops,

conducting the yarn leaving said air jet to and through a second feed roll system which feeds said yarn at a controlled rate into and through a steam chamber containing saturated steam at about 220 to about 300 degrees Fahrenheit thereby substantially eliminating said random unstable loops,



the yarn exiting the steam chamber being conducted to and through a fourth roll system operating in cooperation with said second feed roll system to restrain and control the linear shrinkage of said yarn within the steam chamber, and thence guiding the drawn, textured and steam treated yarn to a take-up system,

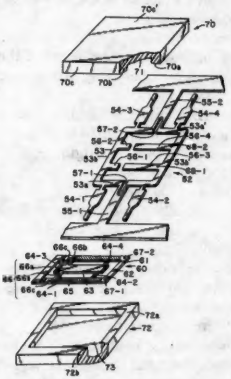
thereby producing a highly resilient textured yarn having substantially no unstable loops, said yarn exhibiting less than fully oriented fiber birefringence.

4,571,794

METHOD OF ACCOMMODATING ELECTRONIC COMPONENT IN CASING

Takeshi Nakamura, Uji, Japan, assignor to Murata Manufacturing Co., Ltd., Kyoto, Japan

Filed Jul. 19, 1983, Ser. No. 515,262
Claims priority, application Japan, Jul. 22, 1982, 57-128466
Int. Cl.[4] H04R *17/00*
U.S. Cl. 29—25.35 **9 Claims**



1. A method of accommodating an electronic component between a first casing and a second casing, comprising the steps of:

placing a mating face of the first casing and a corresponding mating face of the second casing in a confronting relationship with each other;

placing a terminal frame with a substrate portion between the mating face of the first casing and the corresponding mating face of the second casing, said terminal frame having at least one pair of lead terminals on the substrate portion and two intermediate electrically conductive terminals, each having a U-shaped slot projecting outwardly from opposite sides of the substrate portion;

placing the electronic component in contact between the substrate portion and the mating face of one of the casings;

passing an electric current from the one electrical conductive terminal projecting from one opposite side of the substrate portion, through the substrate portion, to the one electrical conductive terminal projecting from the other opposite side of the substrate portion so that the mating face of the first casing and the corresponding mating face of the second casing are attached together by melting to each other; and

cutting off the electrical conductive terminals completely from the substrate portion of the U-shaped slots;

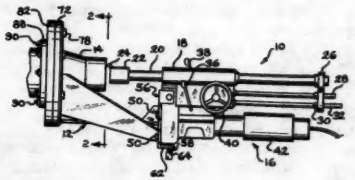
whereby one of the at least one pair of lead terminals on the substrate portion is electrically insulated from the other of the at least one pair of lead terminals on the same side of the substrate portion and the electronic component is accommodated between the first casing and the second casing.

4,571,795

APPARATUS FOR REBUILDING VEHICLE AXLES

Leo C. Shiets, 560 S. State Rte. 19, Fremont, Ohio 43420

Division of Ser. No. 339,622, Jan. 15, 1982, Pat. No. 4,455,732.
This application Jun. 26, 1984, Ser. No. 624,613
Int. Cl.[4] B23P *7/00*; B23B *45/14*
U.S. Cl. 29—26 B **4 Claims**



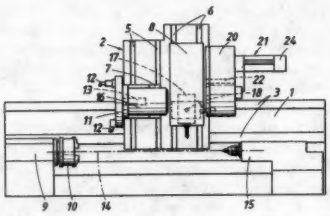
1. An apparatus for facilitating the rebuilding of vehicle axles having flanges disposed adjacent the terminal portion thereof comprising, in combination, a boring machine having a boring cutter and means to rotate and axially translate said boring cutter, and a mounting assembly having a first plate selectively secured to said boring machine, a plurality of adjustment means for providing bi-axial movement of said boring machine relative to said first plate of said mounting assembly, a plurality of braces extending between said first plate and a second plate, said second plate defining a centrally disposed opening suitable for receiving such vehicle axle and a plurality of apertures spaced about said opening, and a third plate disposed adjacent said second plate, said third plate defining a central bore which receives such vehicle axle, a first plurality of apertures arranged in coincidence with said apertures in said second plate for receiving fasteners, and a second plurality of apertures arranged in coincidence with apertures in such vehicle axle flange for receiving fasteners.

4,571,796

LATHE

Jörg Sellner, Linz; Rudolf Siegwart, Leonding, both of Austria, and Siegfried Grauli, Gemmingen, Fed. Rep. of Germany, assignors to Voest-Alpine Aktiengesellschaft, Linz, Austria

Filed Nov. 26, 1984, Ser. No. 674,686
Claims priority, application Austria, Dec. 1, 1983, 4192/83
Int. Cl.[4] B23B 7/14, 11/00; B23Q 3/157
U.S. Cl. 29—27 R 3 Claims



1. In a lathe comprising

a bed,

a headstock and a tailstock mounted on and spaced apart along said bed and defining a main axis extending along said bed,

a saddle mounted on said bed and movable along said main axis past said headstock and past said tailstock and provided with first and second transverse guides spaced apart along said main axis and extending in a transverse direction at right angles to said main axis,

first and second cross slides mounted on said saddle and spaced apart along said main axis and in contact with and movable along siad first and second guides, respectively, and

first and second toolholding means carried by said first and second cross-slides, respectively, wherein said first cross slide is nearer to said headstock than said second cross slide and the latter is nearer to said tailstock than said first cross slide and each of said cross slides has an inner end portion facing said main axis,

the improvement residing in that

each of said cross slides is movable independently of the other in said transverse direction away from said main axis to an outer end position,

one of said first and second toolholding means comprise a turret mounted on that side of one of said cross slides which is remote from the other of said cross slides,

said turret is mounted on said one cross slide for rotation on an axis that is parallel to said main axis,

the other of said first and second tool-holding means comprise a tool head mounted on said inner end portion of the other of said cross slides for angular adjustment about a pivotal axis that is at right angles to said main axis and said transverse direction,

said tool head comprises a tool spindle which extends at right angles to said pivotal axis and is adapted to be rotationally driven,

said first cross slide in its said outer end position is movable together with said first toolholding means by said saddle along said main axis past said headstock, and

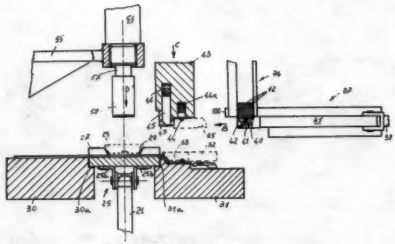
said second cross slide in its said outer end position is movable together with said second toolholding means by said saddle along said main axis past said tailstock.

4,571,797

MACHINE FOR MANUFACTURING FOLDING SHAVING RAZORS

Athos Bergamaschi, Via Della Resistenza 13, Trebbo Di Reno (Province of Bologna), Italy

Filed Jan. 17, 1983, Ser. No. 458,593
Claims priority, application Italy, Jan. 26, 1982, 3317 A/82
Int. Cl.[4] B23P 23/04
U.S. Cl. 29—33 K 5 Claims



1. A machine for manufacturing folding shaving razors including a flattened plate-like element formed from a plastic-like material, wherein folding lines define two substantially square areas wherebetween there intervene a center rib and an end rib which is a unitary construction and forms an obtuse angle with a rectangular blade holder strip whereto a rectangular blade covering strip is articulated through thin side tabs, said strips being assemblable together by inserting pegs made rigid with one strip into respective holes in the other strip and then deforming one end of said pegs, wherein said machine comprises:

a stationary frame;

two parallel and coplanar shafts mounted at the ends of said frame;

two sprocket wheels respectively carried by said two parallel and complanar shafts;

a closed loop transport chain running around said two sprocket wheels;

connecting plates attached along said chain brackets secured on said connecting plates;

notches formed over front and rear walls of said brackets for supporting the square center areas of the razors;

a fixed horizontal member lying downstream in the plane of advance of the razors;

two elements located above said second side member and having curvatures adapted to hold said razors rigid with the brackets in an open configuration;

a magazine for stacked blades;

a chest below said magazine;

means to horizontally drive said chest from a pick up position underlying said stacked blades to a discharge position overlying said chain;

a slider having suction and blowing means;

means to move said slider vertically at said discharge position of said chest;

said slider being adapted to be lowered onto said chest to pick up by suction a blade therefrom and to be then further lowered, with said chest in the withdrawn position, to deposit said blade onto the blade holder strip of a razor; fixed contoured detents effective to produce, as said brackets are being advanced, folding of said blade covering strip around said tabs onto said blade holder strip; a fastener assembly located successively to said fixed detents and including a heater headpiece supported for vertical movement and adapted to spread the free end of said pegs apart for securing said blade between said blade holder strip and said blade covering strip.

4,571,798

URETHANE COVERED PAPER MACHINE ROLL

Richard J. Adams, Rockton, Ill., assignor to Beloit Corporation, Beloit, Wis.

Filed Sep. 19, 1983, Ser. No. 533,310
Int. Cl.[4] B30B *11/18*
U.S. Cl. 29—121.8 5 Claims

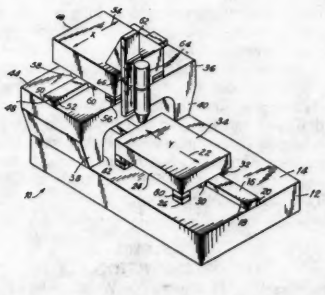
1. A press roll which comprises a metal roll body and a spray deposited impervious elastomer cover around and secured to said body having a micro structure containing small isolated closed pores throughout the thickness thereof and a finished stone-like peripheral surface with uncovered pores isolating a myriad of smooth areas surrounded by seams defined by the walls of the uncovered pores, and said pores beneath said peripheral surface remaining isolated and closed to maintain the imperviousness of the cover.

4,571,799

METHOD FOR PRODUCING AIR BEARING PADS FOR POSITIONING TABLE

Anwar Chitayat, Plainview, N.Y., assignor to Anorad Corporation, Hauppauge, N.Y.

Division of Ser. No. 218,930, Dec. 22, 1980, Pat. No. 4,392,642.
This application Aug. 26, 1982, Ser. No. 411,595
Int. Cl.[4] B21D *53/10*
U.S. Cl. 29—149.5 A 2 Claims



1. A method of making an air bearing pad of the type having an upper portion, a lower portion and a neck portion joining centers of said upper and lower portions, said air bearing pad being of a type having air channels therein terminating in a bottom surface thereof, comprising:

forming a block of metal having said bottom surface;

grinding and lapping said bottom surface;

then machining said block of metal to form said neck portion;

performing the machining step by machining said block of metal to a predetermined reduced limit, and thereby causing said neck portion to include a section which is relatively weaker than a remainder of said block of metal and thus capable of slight lateral deformation with respect to said remainder; and

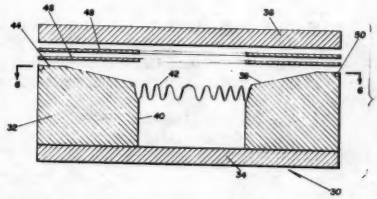
performing the machining step without applying sufficient stress to said block of metal to produce a strain exceeding an elastic deformation limit of the material forming said neck portion whereby a relationship of said ground and lapped bottom surface with respect to said upper portion is retained.

4,571,800

METHOD FOR EXPLOSIVELY FORMING AN AUXILIARY EXIT CONE FOR THE NOZZLE OF A ROCKET MOTOR

Lawrence C. Faupell, North Logan, Utah, assignor to Thiokol Corporation, Chicago, Ill.

Filed Jul. 11, 1983, Ser. No. 512,274
Int. Cl.[4] B23P *13/00*
U.S. Cl. 29—157 C 7 Claims



1. The method of forming an auxiliary exit cone for the nozzle of a rocket motor comprising the steps of

positioning and sealing a flat circular sheet of thin high temperature resistant material having a coaxial circular opening therein in operative association with the forming surface of a die with the circular sheet of material gripped fixedly at the peripheral edge thereof to a peripheral edge of the die, the forming surface of the die being within the boundary of the outer edge thereof and having the shape of a frustum of a cone with longitudinally directed sinusoidal tapered flutes formed therein and positioned adjacent a substantial portion of the area of said circular sheet of material, and

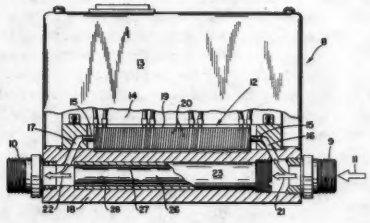
explosively producing a pressure shock to cause said substantial portion of said circular sheet of material to engage and conform to the shape of the forming surface of the die.

4,571,801

METHOD OF MANUFACTURING A CARTRIDGE UNIT FOR ESTABLISHING CONTROLLED LAMINAR-FLOW CONDITIONS

James H. Ewing, Brockton, Mass., assignor to MKS Instruments, Inc., Burlington, Mass.

Division of Ser. No. 504,530, Jun. 15, 1983, Pat. No. 4,522,058.
This application Nov. 30, 1984, Ser. No. 676,654
Int. Cl.[4] B21D *53/00;* B21K *29/00;* B23P *15/26*
U.S. Cl. 29—157 R 2 Claims



1. The method of manufacturing a cartridge unit for insertion into and establishing controlled laminar-flow conditions along a relatively short length of a main fluid flow path having a relatively large cross-section, which comprises arraying and fastening ast least three wire-form elements of relatively small cross-section in angularly-spaced relation about the longitudinal axis of and directly upon and substantially parallel with an

elongated solid core member of relatively large cross section, and, while said elements are so arrayed upon the exterior of the core member and fastened thereto, forcibly inserting their combination longitudinally into a tubular cartridge member having an interior cross-section with which said elements upon the core member make firm interference fit, and continuing the insertion of the combination into the tubular member for at least a distance at which the effective length-to-diameter ratio of elongated spaced defined between the said elements and core and tubular members is sufficient to promote laminar flow of fluid longitudinally therethrough.

4,571,802

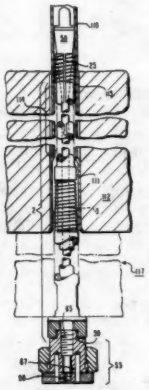
DOUBLE GRIP, RELATIVE MOTION TUBE PULLER

Gregory L. Calhoun, 457 Markle Rd., Apollo, Pa. 15613; Michael G. Brunner, 310 Marose Dr., Pittsburgh, Pa. 15235, and Kevin L. Fields, 1 Windsor Rd., A-8 Alvin Ct., Pittsburgh, Pa. 15239

Filed Apr. 30, 1984, Ser. No. 605,351

Int. Cl.[4] B23P *15/26*

U.S. Cl. 29—157.3 R **35 Claims**



30. A process for removing a conduit from a structure which frictionally engages a longitudinal portion of the outside walls of said conduit, comprising the steps of:

(a) gripping first and second points along the longitudinal axis of said conduit with a first and second gripping means respectively, wherein said first and second points define a longitudinal section of said conduit which corresponds at least in part with said longitudinal portion of said conduit;

(b) applying a first tensile force to said first gripped point through said first gripping means while said second gripping means is free to move with respect to said first gripping means in order to plastically deform said conduit, reducing the radial cross-section of said conduit, thereby relieving at least some of the frictional force between said structure and said longitudinal portion of said conduit;

(c) applying a second tensile force to said second gripped point through said second gripping means which is substantially equal to said first tensile force after said conduit is plastically deformed by said first tensile force, said second tensile force cooperating with said first tensile force and said first and second gripping means to substantially relax the tension in said longitudinal section imparted by said first tensile force; and

(d) removing said conduit from said structure while said longitudinal section is substantially isolated between said first and second gripping means from said first and second tensile forces.

4,571,803

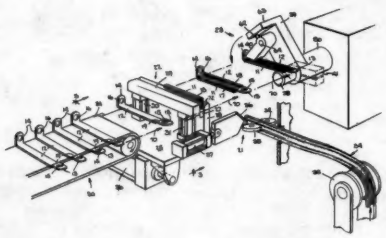
FABRICATION APPARATUS FOR CUSHIONED LINE SUPPORT

William W. Chatfield, Jamestown, N.C., assignor to Transamerica Delaval Inc., Princeton, N.J.

Filed Jun. 14, 1984, Ser. No. 620,745

Int. Cl.[4] B23P *19/02*

U.S. Cl. 29—235 **18 Claims**



1. Apparatus for assembling a predetermined length of an elastomeric cushion and a metal strap to produce a cushioned strap and thereafter forming the cushioned strap around a mandrel to produce a cushioned line support, said cushion having a back joining side edges that merge into a front having spaced apart lips giving the cushion a C-shape cross-section, and said strap having two ends and a middle, said apparatus comprising in combination: means for advancing a predetermined length of said cushion from a stock length onto a support member, means for severing said predetermined length from said stock length, means for gripping a given size metal strap from an infeed and transporting said strap along a path that crosses said support member and intercepts said cushion when said cushion is on said support member, said path being located to guide said strap, while being transported, such that said strap slips under one lip of said predetermined length of cushion while the other lip of said cushion is engaged by cushion engaging means associated with said support member, means for imparting movement to said cushion engaging means when said strap transporting means has crossed said support member, said movement of said cushion engaging means causing said other lip of said cushion to be released and to wrap around and lie over said strap, said gripping means being arranged to continue transporting said strap until it reaches a forming station, and means at said forming station including a mandrel for bending said cushioned strap into a generally C-shape configuration

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4,571,804

O-RING INSERTION TOOL

Wolfgang Grabler, Mannheim, and Werner Klepsch, Neustadt, both of Fed. Rep. of Germany, assignors to Deere & Company, Moline, Ill.

Filed Feb. 21, 1985, Ser. No. 704,110

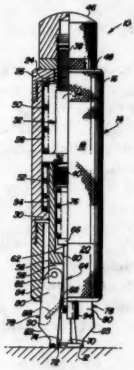
Claims priority, application Fed. Rep. of Germany, Feb. 21, 1984, 3406144

Int. Cl.[4] B23D *19/02*

U.S. Cl. 29—235 **13 Claims**

1. In an O-ring insertion tool including a housing defining a guide bore having an open end, an O-ring carrier supported by the housing in alignment with the longitudinal axis of and projecting from said end of said bore, an O-ring guide including a stem reciprocably mounted for movement along said guide bore and projecting from said end of the latter centrally through said carrier and having an enlarged cylindrical end adapted for slidable insertion through an open end of a part bore in which is located a recess for receiving an O-ring carried by the carrier, and a stripper supported by the housing for movement along said axis relative to said carrier between stripping and non-stripping positions, the improvement, com-

prising: said stripper being fixed to and projecting from an end of said housing; means supporting said carrier for reciprocable movement along said axis relative to said housing between an



extended O-ring pick-up position and a retracted O-ring deposit position; and resiliently yieldable means acting between the housing and said means for supporting said carrier and normally maintaining said carrier in its O-ring deposit position.

4,571,805

APPARATUS FOR CLOSING TUBULAR WRAPPERS WITH U-SHAPED CLOSING CLIPS

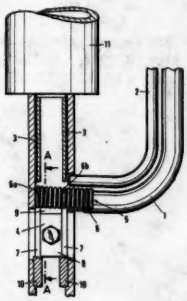
Herbert Niedecker, Am Ellerhang 6, D 6240 Königstein 2, Fed. Rep. of Germany

Filed Sep. 19, 1984, Ser. No. 652,708

Claims priority, application Fed. Rep. of Germany, Sep. 20, 1983, 3333875

Int. Cl.[4] B23P *11/00*

U.S. Cl. 29—243.56 **1 Claim**



1. In an apparatus for closing tubular wrappers with U-shaped closing clips, including a magazine for clips, a pair of spaced apart punches for simultaneously pushing and closing a pair of closing clips from said magazine in respective clip-guiding passages onto a die and there closing said clips around the gathered end of the wrapper, and means for advancing said punches from retracted position to clip advancing and closing position, the improvement which comprises providing a single magazine rod for supplying clips to both clip-feeding passages, and an intermediate member which constitutes an extension of the magazine rod provided between the two clip-guiding passages, whereby when the two punches are retracted two additional closing clips are delivered from the magazine rod and each clip-closing passage is thus supplied with a new closing clip.

4,571,806

APPARATUS FOR ASSEMBLING BUTTONS

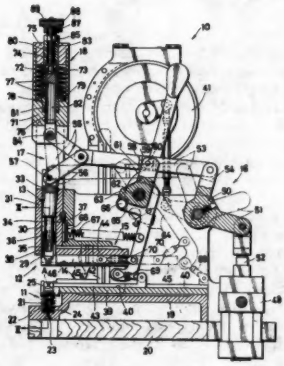
Fumio Seki, Toyama, Japan, assignor to Nippon Notion Kogyo Co., Ltd., Tokyo, Japan

Filed Jun. 26, 1984, Ser. No. 624,819

Claims priority, application Japan, Jul. 8, 1983, 58-106308[U]

Int. Cl.[4] B23P *19/02*

U.S. Cl. 29—251 **4 Claims**



1. An apparatus for assembling a pair of fastener elements, comprising:

(a) a frame;

(b) a punch and a die assembly mounted on said frame in opposed relation to one another, said punch assembly being reciprocable with respect to said die assembly to fasten the pair of fastener elements together;

(c) a drive mechanism mounted on said frame and operatively connected to said punch assembly to reciprocate the same, said drive mechanism including a toggle joint having a pair of levers pivoted together at one end, the free end of one of said levers being connected to said punch assembly; and

(d) a combined shock-absorbing and stroke adjusting mechanism acting between said frame and the free end of the other of said levers, said combined mechanism includng:

(1) a tubular casing secured to said frame;

(2) a hollow cylindrical holder slidably supported in said casing;

(3) resilient shock-absorbing means disposed in said casing and acting between said casing and said holder and biasing said holder toward said free end of said other of said levers; and

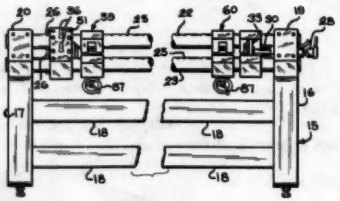
(4) a slide bar movably mounted in said hollow cylindrical holder and having one end adjustably secured to said slidable holder and its other end pivotably connected to said free end of said other lever;

whereby said holder and said slide bar are movable in unison away from said punch and die assembly against the resiliency of said shock-absorbing means, and said slide bar is axially adjustable relative to said holder.

4,571,807
DRIVESHAFT REBUILDING MACHINE

Gordon E. Hines; Arthur W. Henke, and Vernon J. Burzan, all of Ann Arbor, Mich., assignors to Hines Industries, Inc., Ann Arbor, Mich.

Filed Apr. 12, 1984, Ser. No. 599,510
Int. Cl.[4] B23P 19/04
U.S. Cl. 29—252 16 Claims

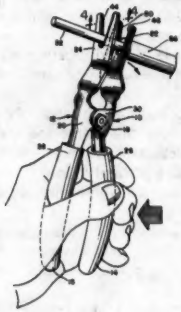


1. A driveshaft machine for installing a driveshaft end piece on a driveshaft tube comprising, in combination, opposed machine ends, support members extending between said opposed machine ends, a pair of parallel guide rods mounted between said ends, a pair of clamp assemblies spaced from one another and mounted for movement on said parallel guide rods, said clamp assemblies including clamp jaws for engaging and centering a driveshaft tube, each of said clamp assemblies including a cross bar operatively mounted for movement along said guide rods, said cross bar defining upper and lower slide surfaces, each of said clamp jaws including an upper bearing pin for movement along such upper slide surfaces and a lower bearing pin for movement along said lower slide surfaces, means for moving said clamping jaws towards and away from one another, fixture means adjacent at least one machine end for aligning a driveshaft end piece with the driveshaft tube, and cylinder means for moving said fixture means relative to the driveshaft tube to press fit the driveshaft end piece with the driveshaft tube.

4,571,808
RADIATOR HOSE SEPARATOR PLIERS CONSTRUCTION

Michael H. King, Kelowna, Canada, assignor to Lisle Corporation, Clarinda, Iowa

Filed Mar. 5, 1984, Ser. No. 586,417
Int. Cl.[4] B23P 19/04
U.S. Cl. 29—268 2 Claims



1. A plier-like tool for removing a flexible tubing from a pipe comprising, in combination:

a first and second plier member including first and second handle ends, first and second intermediate pivot sections, and first and second substantially planar jaw ends, respectively, said first and second substantially planar jaw ends having substantially identical size and shape;

a pivot connection for pivotally connecting said first and second plier members at said first and second intermediate pivot sections; and

spring means for normally biasing said first and second handle ends apart and for normally biasing said first and second jaw ends together in an engaged relationship, said first and second jaw ends aligning, overlapping, and abutting in said engaged relationship;

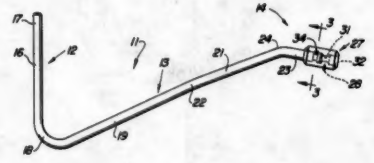
said first jaw end having a first outside surface opposite said second jaw end and defining a gripping V-shaped opening extending substantially transverse to the direction of movement of said second jaw end in response to activation of said first and second handle ends during operation, said gripping V-shaped opening having a greater width adjacent a distal end thereof, said gripping V-shaped opening being defined by a first inside surface forming a pair of knife edges along said gripping V-shaped opening extending substantially from said distal end thereof, said first inside surface intersecting said first outside surface at an acute angle;

said second jaw end having a second outside surface opposite said first jaw end and defining a free V-shaped opening, said free V-shaped opening and said gripping V-shaped opening having substantially identical size and shape and aligning and overlapping in said engaged relationship, said free V-shaped opening being adapted to interpose said gripping V-shaped opening and said flexible tubing, to slide along said pipe, said handle ends so as to remove and to drivingly engage said flexible tubing upon actuation of said flexible tubing from said pipe.

4,571,809
SHOCK ABSORBER TOOL

Robert O. Rossow, 255 Oak St., Hampshire, Ill. 60140

Filed May 10, 1984, Ser. No. 609,061
Int. Cl.[4] B23B 27/00
U.S. Cl. 29—270 2 Claims



1. A tool, for removing shock absorbers mounted to vehicles by shafts having securement nuts, comprising:

body means;

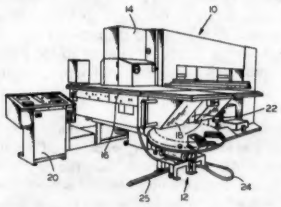
handle means joined at a first angle to said body means; and

head means joined at a second angle to said body means and having a bore means for engaging a shock absorber, said bore means including a constricted bore length, said head means including a bar joined to said body means at said second angle, and a head carrying said constricted bore length and being removably and rotatably mounted on said bar, said bore means including a second bore length, formed in said head and communicating with said constricted bore length, for receiving said bar.

4,571,810
INSTALLATION COMPRISING AUTOMATIC MACHINE TOOLING AND SORTING APPARATUS

Berthold Leibinger, Gerlingen, Fed. Rep. of Germany, assignor to Trumpf America, Inc., Farmington, Conn.

Filed Jan. 27, 1984, Ser. No. 574,347
Int. Cl.⁴ B23P *17/00*
U.S. Cl. 29—412 **7 Claims**



1. In an automatic installation for producing a variety of parts from a workpiece and for sorting the parts so produced, the combination comprising:

A. a machine tool for producing a multiplicity of different parts from a workpiece, said tool including control means for controlling the action of a cutting tool thereupon to selectively produce a multiplicity of different parts from a workpiece, and for discharging the parts produced at a common location; and

B. a sorting unit associated with and disposed adjacent said machine tool, said unit comprising

(i) a base;

(ii) a turntable rotatably mounted upon said base for movement about said common location for discharge of the parts;

(iii) a multiplicity of receptacles disposed on said turntable at each of a multiplicity of angularly spaced positions about the axis of rotation, said receptacles being dimensioned and positioned to receive parts discharged from said machine at said common location upon movement of said turntable to locate receptacle thereat;

(iv) drive means for rotating said turntable upon said base to locate a selected one of said receptacles adjacent said common location of said machine tool to receive parts therefrom;

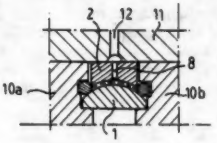
said control means of said machine tool also controlling said drive means of said sorting unit in relation to the operation of said machine tool to cause said turntable to rotate to locate a different one of said receptacles corresponding to a selected one of the different parts produced by said machine tool adjacent said common location to receive parts discharged therefrom, whereby said installation can produce a variety of parts from a workpiece and can segregate the parts into different, substantially homogeneous batches within said receptacles.

4,571,811
PROCESS FOR MANUFACTURING BALL JOINTS OR OTHER SELF-LUBRICATED JOINTS

Bernard Pruvost, Tournon, France, assignor to S.K.F. Compagnie d'Application Mecaniques & Compagnie, Saint Vallier sur Phone, France

Filed Jan. 24, 1984, Ser. No. 573,503
Claims priority, application France, Jan. 28, 1983, 83 01663
Int. Cl.⁴ B23P *11/00, 11/02;* B21D *53/10;* F16C *11/06*
U.S. Cl. 29—436 **7 Claims**

1. A process for manufacturing ball joints or other self-lubricated joints, comprising assembling the inner ring of a ball joint within a heat retractable sheath of determined thickness, shrinking the sheath about the outer surface of said inner ring, assembling the inner ring and shrunken sheath within an outer ring blank, deforming said outer ring blank so that the sheath is clamped between the deformed outer ring blank and the inner ring, eliminating the sheath from between the inner ring and the deformed outer ring blank thereby to leave between

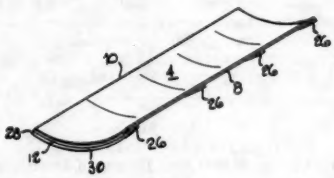


the inner ring and the deformed outer ring blank a free space whose thickness corresponds to that of the sheath, and injecting a self-lubricating resin in said free space.

4,571,812
METHOD FOR MAKING A SOLAR CONCENTRATOR AND PRODUCT

Randall C. Gee, Golden, Colo., assignor to Industrial Solar Technology, Denver, Colo.

Filed Feb. 16, 1984, Ser. No. 580,820
Int. Cl.⁴ B23P *9/00*
U.S. Cl. 29—445 **10 Claims**



1. A method for making a solar concentrator comprising:

forming a sheet member into a substantially self-sustaining arcuate section of a predetermined constant radius of curvature having opposed longitudinally extending edges;

forming at least one reinforcing rib into a substantially self-sustaining arcuate section having a constant radius of curvature substantially the same as said radius of curvature of said sheet member and having opposed longitudinally extending edges;

securing said formed sheet member to said formed reinforcing rib;

applying a force to at least one of said edges of said reinforcing ribs to move said edges of said reinforcing rib and said edges of said formed sheet member closer together; and

continuing the application of said force until said formed sheet member and said formed reinforcing rib have been cnanged to a predetermined substantially parabolic configuration.

4,571,813
AUTOMATIC TOOL CHANGING APPARATUS FOR MULTI-SPINDLE MACHINE TOOL

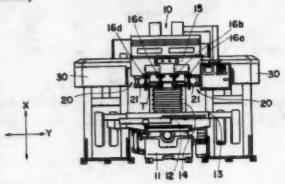
Masayuki Fukuoka, and Satoshi Matsumoto, both of Fuchu, Japan, assignors to Sakazaki Machinery Works Co., Ltd., Tokyo, Japan

Filed Aug. 22, 1983, Ser. No. 524,979
Claims priority, application Japan, Jun. 9, 1983, 58-103218
Int. Cl.⁴ B23Q *3/157*
U.S. Cl. 29—568 **7 Claims**

1. An automatic tool changing apparatus for a vertical type multi-spindle machine tool, having a head stock on which is disposed four or more spindles linearly having equal intervals

with respect to each other at the lower portion of said head stock which is provided with an outer side, and comprising:

a plurality of tool-changing arms having inner sides, each arm of which is provided with a straight form, and the respective arms are disposed in vertically and horizontally movable directions at the outer side of said lower portion of said head stock; grasping members disposed linearly on each inner side of said tool-changing arms and having a spacing equal to that of said spindles, and the number of said grasping members being half that of the number of said spindles;



tool magazines being provided adjacent to both sides of said head stock and each said tool magazine having a plurality of tool pots;

a first driving means provided on said head stock to rotate said tool-changing arms in a horizontal direction by 90° from said lower portion of said head stock to positions where tool changing is carried out between said arms and the corresponding tool magazines; and

a second driving means provided on said head stock to move said tool-changing arms in a vertical direction.

4,571,814

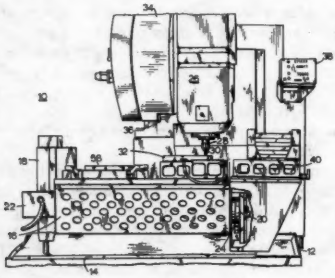
AUTOMATED MACHINING SYSTEM

Kenneth J. Palfery, 38 Berl Ave., Toronto 18, Ontario MY83C4, and Kenrick B. Maharaj, 6 Linkdale Rd., Brampton, Ontario L6V2Y4, both of Canada

Filed Dec. 14, 1984, Ser. No. 681,802

Int. Cl.[4] B23Q *3/157*

U.S. Cl. 29—568 **7 Claims**



1. An automated machining center, comprising:

(a) A frame;

(b) A movable worktable means connected to the frame for supporting a workpiece and movable longitudinally and latitudinally to position the workpiece at a desired point in a horizontal plane;

(c) Pivot means connected to each end of the movable worktable means for rotation of the movable worktable means about its horizontal axis;

(d) A rotary indexing means mounted on the movable worktable means for rotating the workpiece in response to the horizontal position of the movable worktable means;

(e) A material handling means connected to the worktable means for storing a stack of material to be machined, transporting a workpiece from the stack of material to a machining station on the movable worktable means, and a workpiece pickup means for picking up the workpiece and transporting the workpiece to the rotary indexing means on the movable worktable means; and

(f) A workpiece turnover means for removing the workpiece from the worktable, turning the workpiece over, and returning the workpiece to the worktable;

(g) A rotatable spindle means connected to the frame for supporting a cutting tool and rotating the cutting tool at a predetermined speed rate to machine the workpiece;

(h) A tool changing means connected to the frame for storing tools and exchanging the tool supported in the rotatable spindle means with one of a multitude of different tools stored therein;

(i) An adjustable torque driving means configured to be stored in the tool changing means and rotated by the rotatable spindle means such that the adjustable torque driving means drives bolts into the workpiece to secure the workpiece to the movable worktable means and removes bolts from the workpiece to detach the workpiece from the movable worktable means after machining;

(j) A programmable control means disposed to control the movable worktable means, the rotatable indexing means, the rotatable spindle means, the workpiece turnover means, the tool changing means, the material handling means, the adjustable torque driving means, and the workpiece pickup means; for automatically loading the workpiece onto the worktable, performing multiple machining functions on the workpiece, and unloading the workpiece from the worktable after machining.

4,571,815

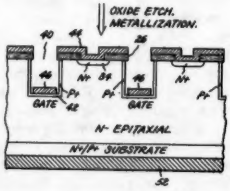
METHOD OF MAKING VERTICAL CHANNEL FIELD CONTROLLED DEVICE EMPLOYING A RECESSED GATE STRUCTURE

Bantval J. Baliga, Clifton Park, and Robert P. Love, Schenectady, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 324,163, Nov. 23, 1981, abandoned. This application Sep. 12, 1984, Ser. No. 650,315

Int. Cl.[4] H01L *21/38*

U.S. Cl. 29—571 **7 Claims**



1. A method of fabricating a vertical channel electric field controlled device having a recessed gate structure and being of the type including a semiconductor base region of one conductivity type and a gate region of opposite conductivity type, said method comprising:

providing a semiconductor wafer having a base layer of the one conductivity type;

forming a layer of silicon dioxide with a plurality of windows on one surface of the base layer, alternate windows defining the ultimate locations of upper electrode regions and gate regions;

forming an etchant barrier of silicon nitride patterned so as to cover the windows in the silicon dioxide layer defining the ultimate locations of gate regions, and to leave open the windows in the silicon dioxide layer defining the ultimate locations of upper electrode regions;

introducing into the base layer through the windows in the silicon dioxide layer defining the ultimate locations of

upper electrode regions impurities appropriate to form upper electrode regions of the one conductivity type and of higher conductivity than the base region;

growing an oxide layer over the diffused upper electrode regions thinner than the oxide layer over the remainder of the base layer;

removing the silicon nitride barrier to expose the windows in the silicon dioxide layer defining the ultimate locations of gate regions;

forming substantially vertically-walled grooves beneath the gate region windows;

introducing into the sidewalls and bottoms of the grooves impurities appropriate to form gate regions of the opposite conductivity type;

removing the oxide layer over the upper electrode regions; and

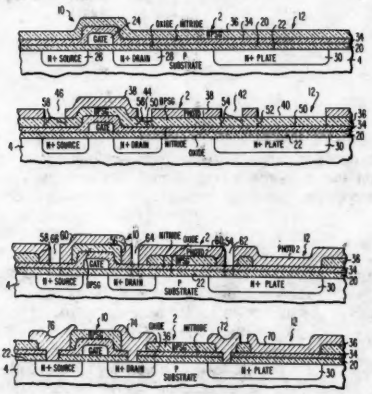
evaporating metal onto the wafer surface to form metalized source terminals in ohmic contact with the upper electrode regions, and to form elongated metallized gate terminal fingers in ohmic contact with the gate regions at the bottoms of the grooves.

4,571,816

METHOD OF MAKING A CAPACITOR WITH STANDARD SELF-ALIGNED GATE PROCESS

Andrew G. F. Dingwall, Somerset County, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Dec. 11, 1984, Ser. No. 680,524
Int. Cl.⁴ H01L *21/94, 27/02, 29/92*
U.S. Cl. 29—571 **8 Claims**



1. In a method of making a semiconductor capacitor device, the steps of:

(a) forming a semiconducting region of one conductivity type having a planar surface;

(b) forming a layer of dielectric material on said planar surface of said semiconducting region;

(c) forming spaced apart first and second openings partially through said layer of dielectric material, said openings being disposed over said semiconducting region;

(d) then extending said second opening completely through the remainder of said layer of dielectric material so that a portion of said semiconducting region is exposed;

(e) forming an electrically conductive first electrode in said first opening; and

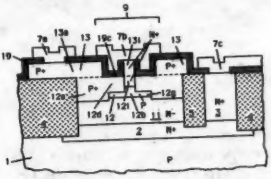
(f) forming an electrically conductive second electrode in said second opening in ohmic contact with said portion of said semiconducting region.

4,571,817

METHOD OF MAKING CLOSELY SPACED CONTACTS TO PN-JUNCTION USING STACKED POLYSILICON LAYERS, DIFFERENTIAL ETCHING AND ION IMPLANTATIONS

Mark S. Birritella, Phoenix, and Kevin McLaughlin, Chandler, both of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Mar. 15, 1985, Ser. No. 712,041
Int. Cl.⁴ H01L *21/225, 21/265, 21/308*
U.S. Cl. 29—576 B **31 Claims**



1. A method for fabricating closely spaced contacts to a PN junction comprising:

providing a semiconductor substrate having therein a first region of a first conductivity type and a second region of a second conductivity type overlying said first region;

covering said second region with a first polycrystalline semiconductor layer;

covering said first polycrystalline layer with a first dielectric layer;

covering said first dielectric layer with a second dielectric layer;

covering said second dielectric layer with a second polycrystalline layer;

covering said second polycrystalline layer with a first masking layer;

patterning said first masking layer to form an open region above a first portion of said second polycrystalline layer and a mask region above a second portion of said second polycrystalline layer;

doping first portions of said first and second polycrystalline layers with an etch rate reducing dopant through said open region of said masking layer leaving second portions of said first and second polycrystalline layers under said mask region substantially free of said etch rate reducing dopant;

removing a peripheral portion of said mask region to reduce its lateral extent by a predetermined amount;

removing a first part of said second portion of said second polycrystalline layer leaving a second part underneath said mask region;

then performing steps (a)–(d) in any order:

(a) removing the remaining part of said mask region;

(b) removing a first part of said second dielectric layer underlying said first part of said second portion of said second polycrystalline layer;

(c) removing said second part of said second polycrystalline layer; and

(d) after said first part of said second dielectric layer has been removed, removing a first part of said first dielectric layer underlying said first part of said second dielectric layer;

thereafter performing the steps (i)–(v) in any order:

(i) replacing a first part of said second portion of said first polycrystalline layer with a dielectric isolation region, leaving a second part of said second portion of said polycrystalline layer;

(ii) removing a second part of said second dielectric layer overlying said second part of said second portion of said first polycrystalline layer;

(iii) removing a second part of said first dielectric layer overlying said second part of said second portion of said first polycrystalline layer;

(iv) doping a first portion of said second region of said substrate underlying said dielectric isolation region; and

(v) doping said second part of said second portion of said first polycrystalline layer;

thereafter heating said substrate to drive the dopant provided in step (v) above into a second portion of said second region of said substrate proximate to said first portion of said second region of said substrate; and

providing contact means for contacting said second part of said second portion of said first polycrystalline layer.

4,571,818

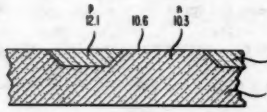
ISOLATION PROCESS FOR HIGH-VOLTAGE SEMICONDUCTOR DEVICES

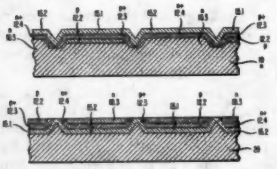
McDonald Robinson, Chester; Harry T. Weston, New Providence, and Yiu H. Wong, Berkeley Heights, all of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Sep. 29, 1983, Ser. No. 537,057

Int. Cl.[4] H01L *21/76*

U.S. Cl. 29—576 W **13 Claims**





1. In a process of forming dielectrically isolated first and second semiconductor bulk regions of differing first and second bulk conductivities, respectively, the steps of:

(a) forming at least one region of the second bulk conductivity in a single-crystal semiconductor wafer initially having the first bulk conductivity, including the steps of (1) forming at least one depression in a major planar surface of the wafer located on one side thereof, (2) growing an epitaxial layer of the second bulk conductivity all over the surface of the one side of the wafer including the surface of the depression at a time when said one side including the depression substantially everywhere has semiconductor of the first bulk conductivity exposed, and (3) planarizing the surface of the epitaxial layer sufficiently to expose the first bulk conductivity at areas which are complementary to the depression;

(b) forming a groove in the wafer at a boundary of said one region after performing said steps;

(c) implanting first impurity ions at an exposed portion of surface of the first region to form a wrap-around or a limited wrap-around layer thereat of higher conductivity then the first bulk conductivity, said exposed portion of surface including a portion and only a portion of the surface of the groove; and

(d) forming an insulating layer upon an exposed surface of at least said first region.

4,571,819

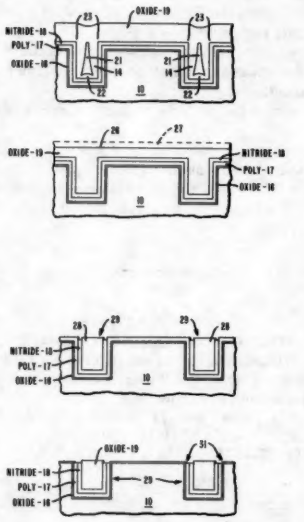
METHOD FOR FORMING TRENCH ISOLATION STRUCTURES

Steven H. Rogers, Midwest City, Okla.; Randall S. Mundt, Colorado Springs, and Denise A. Kaya, Woodland Park, both of Colo., assignors to NCR Corporation, Dayton, Ohio

Filed Nov. 1, 1984, Ser. No. 667,181

Int. Cl.[4] H01L *21/95*

U.S. Cl. 29—576 W **16 Claims**



1. A process for forming a composite trench isolation structure in a substrate, comprising: forming a trench in the substrate; forming a polysilicon etch-stop layer on the trench walls; forming an oxidation-and dopant-blocking silicon nitride layer on the etch-stop layer; filling the trench will silicon dioxide doped to approximately three to nine weight percent of n-type or p-type impurities; heating the resulting structure for a time sufficient to reflow the oxide to thereby collapse voids therein and provide a relatively smooth upper surface; etching back the oxide to remove the oxide outside the trench areas; heating the resulting structure to outgas the impurity dopant from the surface-adjacent region of the oxide; simultaneously or separately to the oxide etch-back step, removing the nitride blocking layer outside the trench; and removing the etch-stop layer from at least selected regions outside the trench; whereby the nitride blocking layer prevents oxidation and doping the underlying structure during the reflow and outgassing steps and the polysilicon layer prevents etching of the underlying structure during the oxide and nitride removal.

4,571,820

DEVICE FOR DISASSEMBLING AND REASSEMBLING A MAIN STEAM ISOLATION VALVE OF A NUCLEAR REACTOR

Takayuki Matsumoto, Yokohama, and Tadahiko Iwai, Fujisawa, both of Japan, assignors to Ishikawajima-Harima Jukogyo Kabushiki Kaisha, Japan

Filed Feb. 17, 1984, Ser. No. 581,431

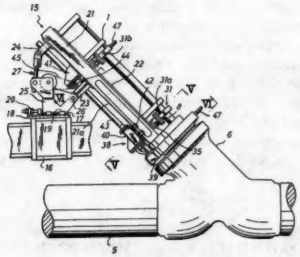
Int. Cl.[4] B23P *19/00*

U.S. Cl. 29—723 **1 Claim**

1. A device for disassembling and reassembling a main steam isolation valve of the type in which the isolation valve installed at an angle relative to a main steam pipe extended from a nuclear reactor is withdrawn along an axis of said isolation

valve from said main steam pipe and then said isolation valve is reinserted into said main steam pipe, comprising a supporting stand mounted on a stationary member thermatically isolated from said isolation valve and adapted to move toward or away from said isolation valve,

guide bars each mounted on said supporting stand such that an angle of inclination of said guide bar can be arbitrarily



adjusted, said guide bars being extended in parallel with the axis of said isolation valve,

a supporting member mounted on said isolation valve for supporting said isolation valve such that said isolation valve can be freely moved over said guide bars, and

drive means mounted on said guide bar and engaged with said isolation valve so as to cause upward or downward movement of said isolation valve along said guide bars.

4,571,821

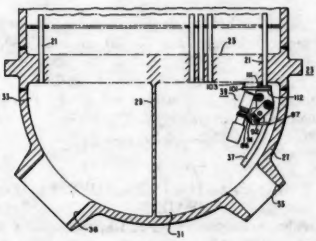
SLEEVE INSERTION

William E. Pirl, Penn Township, Westmoreland County, and John P. Vogeleer, Hempfield, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Aug. 26, 1983, Ser. No. 526,719

Int. Cl.[4] B23P *19/00*; B21D *3/04*

U.S. Cl. 29—727 **5 Claims**



1. For use with a steam generator having an enclosure, a channel head extending outwardly of said enclosure, a tube sheet interposed between said enclosure and channel head, and tubes extending through said tube sheet between said channel head and said enclosure for conducting heated fluid which is converted into steam in said enclosure by heat exchange with said fluid, certain of said tubes being damaged, each said damaged tube to be sleeved by an elongated hollow cylindrical member bent, by deflection of the member beyond the elastic limit of its material, so that it can be manipulated for sleeving within the dimensional limitations of said channel head; apparatus for sleeving each said damaged tube, the said apparatus including a plurality of rolls, means mounting said rolls rotatable, in a train in staggered relationship, there being in said train, a leading roll, a trailing roll and at least one intermediate roll, an inlet to said train, connected to said leading roll, for receiving said bent cylindrical member, said cylindrical member as it is advanced through said train from said inlet to be engaged by each of alternate rolls over opposite portions of its peripheral surface, said rolls being so spaced as to stress the member from the point beyond the elastic limit of the material of said member produced by the bending, to a point in the opposite sense beyond said elastic limit at which the bending is counteracted and the member is straightened, an outlet from said train for the straightened member, means, connected to said mounting means, for suspending said train of rolls pivotally therefrom, means on said suspending means for aligning said outlet with the damaged tube to be sleeved so that the straightened member is capable of being advanced as a sleeve into said damaged tube and for engaging tubes in the neighborhood of the damaged tube to be sleeved, for suspending the train of rolls and drive means, mounted on said mounting means, for rotating said rolls to advance said cylindrical member through said train between said inlet and said outlet and into said damaged tube as a sleeve.

4,571,822

APPARATUS FOR INSERTING COILS INTO STATOR CORE SLOTS

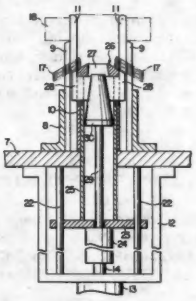
Hiroshi Saito; Hiromasa Okayasu; Shinichi Tsuyuki; Takeshi Kawana, all of Yokohama; Takao Mifune, Ichikawa, and Masanori Yoshizaki, Yachiyo, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 1, 1983, Ser. No. 557,005

Claims priority, application Japan, Dec. 1, 1982, 57-209384

Int. Cl.[4] H02K *15/06*

U.S. Cl. 29—736 **1 Claim**



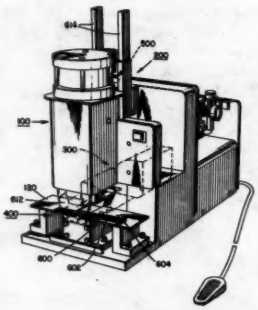
1. An apparatus for inserting coils into slots in a stator core of a dynamoelectric machine including a plurality of blades disposed along a circle at a predetermined circumferential pitch so as to be in opposition to ends of teeth separating adjacent slots from each other, a plurality of projections for projecting into spaces formed between adjacent blades, a stripper disposed at a center of the circle of said blades for pushing the coils supported by said blades into corresponding slots of said core and over the upper ends of said blades, at least the portions of said projections disposed in opposition to said slots in said stator core when said stripper is at the end of an upward stroke thereof are constituted by pushers disposed radially around said stripper for sliding movement in a radial direction; and the coil inserting apparatus further including a cam disposed at the center of said stripper in contact with one end of each of said pushers, and means for moving said cam in an upward and downward direction to cause the pusher to radially compress the coils into the slots.

4,571,823

CONNECTOR TRANSPORT STATION FOR COMPACT SEMI-AUTOMATIC CABLE ASSEMBLY SYSTEM

James D. Anderson, Norwalk, Conn., assignor to Burndy Corporation, Norwalk, Conn.

Filed Feb. 19, 1985, Ser. No. 702,976
Int. Cl.[4] H01R 43/04
U.S. Cl. 29—749 20 Claims



1. Apparatus for installing connectors, each having a body portion and a cover portion, onto flat cables having multiple electrical conductors separated by, and encased in, electrically insulating material, said apparatus comprising:

(a) a frame;

(b) magazines on said frame for supporting a plurality of body portions and cover portions respectively;

(c) an installation station on said frame for coupling connectors to cables supported thereat; and

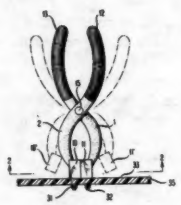
(d) a transport station to sequentially move portions of connectors from said magazines to said installation station, said transport station including rotatable reorientation means to receive connector portions from said magazines and to reorient them while moving them from said magazines toward said installation station, said transport station also including pusher means to receive connector portions adjacent said reorientation means and to transport them to said installation means.

4,571,824

REMOVAL TOOL FOR TERMINAL WITH COMPLIANT PINS

Michael L. Ingaglio, Pinebrook, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Dec. 30, 1983, Ser. No. 567,368
Int. Cl.[4] B23P 19/00; H05K 3/30
U.S. Cl. 29—764 2 Claims



1. A tool for removing a terminal device having compliant pins which are mounted with an underside of the terminal device on a receptacle having a known thickness, the receptacle and terminal device being mounted on a printed circuit board, the tool comprising:

a plier assembly having a pair of handles, a pivot mechanism and first and second jaws which move toward one another when the pair of handles is activated,

the first and second jaws including:

first and second wedge members,

first and second housings, each housing having an end surface that rests on a surface of the printed circuit board and positions the first and second wedge members included within the first and second housings at a proper height equaling the known thickness of the receptacle, said wedges engaging an underside of the terminal device and simultaneously penetrating between the underside of the terminal device and the receptacle on which it rests, thereby, applying a vertical force relative to the surface of the printed circuit board to the underside of the terminal device, and

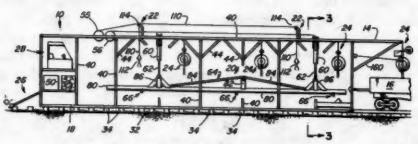
the first and second housing fully enclosing the receptacle and the terminal device when the first and second jaws are closed together.

4,571,825

RAILROAD TRACK REMOVING APPARATUS

Eric T. M. Skibsted, Box 696, Rosebud, Canada (T0J 2T0)

Filed Jul. 20, 1984, Ser. No. 632,797
Int. Cl.[4] B23P 19/00; E01B 29/02, 27/17
U.S. Cl. 29—823 20 Claims



1. An apparatus for removing railroad track, comprising:

an elongated frame arranged to straddle a pair of rails and having elongated skids arranged to sit upon the outboard sides of the ends of ties secured to said rails;

rail and tie separating means mounted on said frame for separating a length of rail from the ties to which said length of rail is secured;

rail elevating means for lifting a length of rail which has been separated from its associated ties by said rail and tie separating means; and

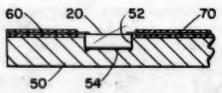
conveyor means for receiving a length of rail lifted by said elevating means and longitudinally transporting said length of rail to one end of said frame.

4,571,826

METHOD OF MANUFACTURING A THERMAL PRINT HEAD

Norman A. Jacobs, Arlington Heights, Ill., assignor to AT&T Teletype Corporation, Skokie, Ill.

Filed Nov. 19, 1984, Ser. No. 672,638
Int. Cl.[4] H05K 3/34, 3/30
U.S. Cl. 29—840 14 Claims



1. A method of manufacturing a thermal print head for a printer, the print head includes a plurality of integrated circuit packages, each package has a plurality of heat generating elements arranged in a row upon a first surface thereof, comprising the steps of;

A. Coating the surface of an elongated channel cut into the

surface of an alignment fixture with a heat responsive first adhesive coating;

B. Placing the integrated circuit packages into said reference channel with the first surface of each integrated circuit package disposed toward the bottom surface of the channel and with the heat generating elements of each integrated circuit package arranged in a row;

C. Placing the alignment fixture in a heated environment to soften the adhesive for adherence to the packages;

D. Cooling the alignment fixture causing the adhesive to securely bond the integrated circuit packages in the reference channel;

E. Placing in an elongated groove cut into the surface of a heat sink a first part of a two part adhesive;

F. Coating the exposed surfaces of the integrated circuit packages with a second part of said two part adhesive;

G. Positioning the alignment fixture with respect to said heat sink so that the integrated circuit packages are placed within the groove of the heat sink and in contact with the first part of the two part adhesive thereby activating the two part adhesive; and

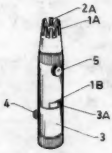
H. Placing the alignment fixture and heat sink assembly in a heated environment to cause the first adhesive in the reference channel to release the integrated circuit packages.

4,571,827

VIBRISSA CUTTERS

Chin-Piao Lee, No. 9 Lane 450, Feng Rd., Tainan, Taiwan

Filed Oct. 17, 1984, Ser. No. 661,715
Int. Cl.[4] B26B *19/16*
U.S. Cl. 30—29.5 **1 Claim**



1. A sort of vibrissa cutter comprising an exterior cylindrical shell mounted with a number of exterior blades on its top, an interior blades rod mounted with the same number of interior blades on its top as the exterior ones and a turning cylinder combined with said interior blade rod by a screw, which is characterized by

said exterior shell cut around its bottom wall with a notch in which a stopping pin on the top of said turning cylinder is to stop the turning of said interior blades when said exterior shell is combined together with the combined body of said interior blade rod and said turning cylinder and

said turning cylinder able to turn only within the limited distance of said notch's width and

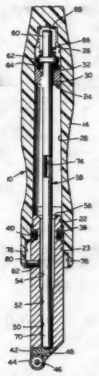
said exterior blades lapping completely with said interior blades whenever said stopping pin of the said turning cylinder stays at either of the limited ends of said notch and the openings between blades in both exterior and interior blades completely coincide with one another so that vibrissae can go into these openings between blades for cutting and will not be pulled while cutting.

4,571,828

LUBRICATED GLASS CUTTER

Roger G. Miffitt, West Hartford, Conn., assignor to Fletcher-Terry Company, Farmington, Conn.

Filed Mar. 19, 1984, Ser. No. 590,866
Int. Cl.[4] B65B *3/00*
U.S. Cl. 30—123.3 **17 Claims**



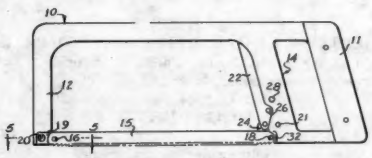
16. A cutting device comprising: a body having a channel portion of circular cross-section extending inwardly from one end thereof; and a head member having a first end portion of corresponding circular cross-section slidably engaged within said channel portion of said body for disengageable and rotatable mounting of said head member therewithin, and having a second end portion extending outwardly of said body and adapted to mount a cutting element in operative position thereon; said body having a rectilinear groove and a separate arcuate recess both said groove and said recess extending, at circumferentially spaced locations, inwardly from said one end of said body and along said channel portion and disconnected from one another, and said head member having a pin projecting radially from said first end portion thereof for alternative engagement in either said groove or said recess, engagement of said pin in said groove constraining said head member against rotation relative to said body, and engagement thereof in said recess permitting swiveling of said head member back and forth through the arcuate length thereof.

4,571,829

QUICK RELEASE HACKSAW BLADE TENSIONING DEVICE

Ernest A. Withers, Jr., 5637 Mountainbrooke Ct., Stone Mountain, Ga. 30087

Filed Jun. 4, 1984, Ser. No. 617,110
Int. Cl.[4] B27B *21/02*
U.S. Cl. 30—144 **5 Claims**



1. A blade tensioning device, for a saw including a frame having a first leg and a second leg and a blade extending between said first leg and said second leg, a first pin carried by said first leg and a second pin carried by said second leg, said

first pin and said second pin receiving said blade thereon, said blade tensioning device including a connecting plate pivotally mounted on a first pivot pin on said first leg and having said first pin extending therefrom, and a lever for rotating said plate in a first direction for moving said first pin towards said second leg and loosening said blade and for rotating said plate in a second direction for moving said first pin towards said first leg and tensioning said blade, the arrangement being such that said connecting plate is rotated for moving said first pin for loosening and tightening said blade, and further including toggle means pivotally connecting said plate to said first leg through said lever and spaced from said first pivot pin for rotating said connecting plate, said lever for rotating said plate being pivotally connected to said plate and constituting operating means for said toggle means.

4,571,830

HAIR CLIPPER

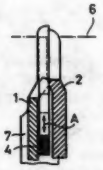
Jochen Kassner, Westring 23, 6231 Schwalbach/Ts, and Friedrich Schreiber, Homburger Landstr. 765, 6000 Frankfurt/M 56, both of Fed. Rep. of Germany

Filed May 16, 1983, Ser. No. 496,296

Claims priority, application Fed. Rep. of Germany, May 14, 1982, 3218208

Int. Cl.⁴ B26B *19/00*

U.S. Cl. 30—200 **4 Claims**



1. A hair clipper, comprising a stationary blade provided with elongated teeth spaced from each other by elongated tooth gaps having a depth; a motor-driven clipper blade also provided with teeth, said clipper blade being reciprocally movable in sliding contact relative to said stationary blade so that the teeth of the clipper blade cooperate with the teeth of the stationary blade to cut hair received in said gaps; and adjusting means being non-removable from the clipper during the operation thereof, said adjusting means including a strip-like member movable relative to said stationary blade in two opposite directions over the entire depth of said tooth gaps and being mounted to said stationary blade, said stationary blade having two opposite end walls formed with elongated grooves, said strip-like member being guided in said grooves during its movement relative to said stationary blade for adjusting the depth of the tooth gaps of the stationary blade so as to adjust a hair-storing and cutting area between the teeth of the stationary blade and the teeth of the clipper blade by partially overlapping said gaps to thereby vary said hair-storing and cutting area and adjust the amounts of hair received in said gaps in operation.

4,571,831

CUTTING HEAD FOR FILAMENT TRIMMER

Donald M. White, III, Chanhassen, Minn., assignor to The Toro Company, Minneapolis, Minn.

Filed Jul. 31, 1984, Ser. No. 636,429

Int. Cl.⁴ B26B *7/00*

U.S. Cl. 30—276 **5 Claims**

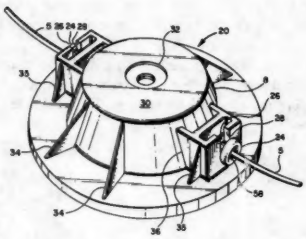
2. A vegetation cutting device having means for rotatably driving a fixed length filament with free ends which form a cutting element and including a vertically disposed drive shaft defining an axis of rotation, the improvement comprising:

(a) a bowl-shaped head attached to said shaft, the concavity of said head facing away from said driving means, said head including a top wall, outwardly sloping sides, and an annular flange defining the open end of said head;

(b) two diametrically opposed apertures in said sides adjacent said flange;

(c) an integral boss adjacent and external to each aperture, said boss terminating in a planar surface inclined inwardly and upwardly at a slight angle to the axis of rotation and including a vertically disposed slot having an open top and a rounded bottom, said slots and said apertures aligned to provide passageways to the interior of said head;

(d) an eyelet pressed into each slot, each eyelet having a central groove defined by an inner and outer flange whose diameters are substantially greater than the width of said slot, the outer flange being bell mouthed in cross-section, said bell mouth providing support for the free ends when said free ends bend back due to contact with an obstruction;



(e) filament retaining means comprising an inverted cup attached concentrically within the concavity of said head, the sides of said cup containing diametrically opposed vertical slits aligned with said slots and apertures, a portion of said cup adjacent said slit bent inwardly thereby making the slit V-shaped when viewed tangentially, whereby said slits are disposed to impose a crimp in said filament to prevent axial movement of said filament during operation, and whereby the V-shaped configuration of the slits allows the use of a variety of filaments with different diameters for different applications, whereby a filament with a small diameter will ride deeper in the V slit than a filament with a relatively great diameter; and

(f) vibration damping means between said slit and said eyelet for preventing vibration generated by said filament from migrating inwardly to said retaining means.

4,571,832

MELON-SLICING APPARATUS WITH ADJUSTABLE GUIDE ROLLER

John Hendy, and Vicki L. Hendy, both of P.O. Box 22022, San Bernardino, Calif. 92405

Continuation-in-part of Ser. No. 423,261, Sep. 24, 1982, abandoned. This application Jul. 11, 1984, Ser. No. 629,669

Int. Cl.⁴ B26B *3/00*

U.S. Cl. 30—280 **2 Claims**

1. A slicing apparatus comprising:

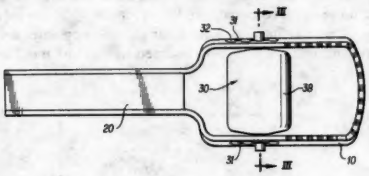
a handle,

a curved continuous loop blade extending from said handle, said blade having a pair of parallel slots therein on opposite ides of said loop, said slots having a lateral width and a plurality of matched circular openings spaced along said slot, each circular opening having a diameter larger than said width, and

adjustable means mounted on said blade for regulating the depth of cut by said blade which includes mounting means passing through both of the slots, a roller rotatably mounted on said mounting means, and spring-loaded

means for retaining said mounting means at a position of one opposed pair of said circular openings,

said mounting means comprising a bolt; said means for retaining comprising an expanded diameter portion in one end portion of said bolt, an adjustment keeper slideably mounted on an opposite end of said bolt having an outer diameter larger than said width of said slots and smaller



than said diameter of said circular openings, a spring retainer cylinder fixed to said opposite end of said bolt and having an inner diameter larger than said outer diameter of said keeper, said retainer cylinder having a length sufficient to extend over one end of said keeper opposite said blade, and a spring mounted in said retainer cylinder biasing said keeper towards said blade.

4,571,833

SAWDUST DISCHARGE PORT

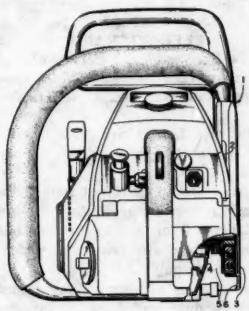
Akira Nagashima, Kawasaki, Japan, assignor to Kioritz Corporation, Tokyo, Japan

Filed Aug. 28, 1984, Ser. No. 644,944

Claims priority, application Japan, Aug. 30, 1983, 58-133120[U]

Int. Cl.[4] B27B *17/00*

U.S. Cl. 30—381 **1 Claim**



1. A sawdust discharge port defined by a body frame of a chain saw and a side wall of a cover member covering said body frame and opened at its lower end, characterized in that said side wall has a substantially flat outer surface, and an inner surface inclined from the plane of said substantially flat outer surface forming an inclined surface whose lower end edge portion is gently inclined inwardly and downwardly to permit said side wall to gradually increase in thickness toward its lower end, a lower side surface of said body frame defining the sawdust discharge port inclined in substantially the same direction as said lower end edge portion.

4,571,834

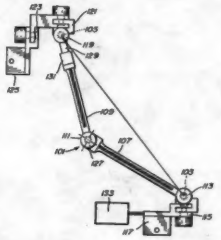
KNEE LAXITY EVALUATOR AND MOTION MODULE/DIGITIZER ARRANGEMENT

Gregory A. Fraser, Montreal, and Simon Raab, Lorraine, both of Canada, assignors to Orthotronics Limited Partnership, Canada

Division of Ser. No. 581,432, Feb. 17, 1984. This application May 16, 1985, Ser. No. 735,080

Int. Cl.[4] G01C *1/08*; G01B *7/00*

U.S. Cl. 33—1 PT **6 Claims**



1. A motion module/digitizer combination comprising:

an elongated member having a first end and a second end and comprising a first link arm and a second link arm and means movably connecting said first link arm to said second link arm so as to permit translational motion between said first end and said second end, said means for connecting being disposed intermediate said first and second ends, said means also including first transducer means for measuring said translational motion;

first mounting means at said first end for mounting said first end at a first point, body or co-ordinate system;

second mounting means at said second end for mounting said second end at a second point or body;

second transducer means at said first end for measuring three dimensional rotational motion of said first link arm relative to said first point or body;

third transducer means at said second end for measuring three dimensional rotational motion of said second link arm relative to said second point or body;

characterized in that said second link arm comprises a detachable portion and a non-detachable portion, said detachable portion of said second link arm being detachable from the non-detachable portion of said second link arm and said second mounting means;

means connectable to the non-detachable portion of said second link arm;

whereby, the combination of said first link arm, the non-detachable portion of said second link arm and said means connectable, can be used to measure the position in space of third, fourth, fifth . . . nth points or combinations thereof;

and whereby, when said non-detachable portion of said link arm is reattached to said detachable portion of said second link arm and said mounting means, measurements can be performed to determine the position or motion in space of said second point or body relative to the position of said first point, body or co-ordinate system or said third, fourth, fifth . . . nth points, or positions of the second body, or combinations thereof.

4,571,835

METHOD OF DEPICTING A SOLID

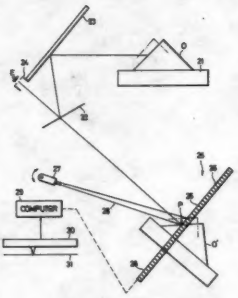
Motomitsu Nishio, Tama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 451,237, Dec. 20, 1982, abandoned. This application May 6, 1985, Ser. No. 731,342

Claims priority, application Japan, Dec. 25, 1981, 56-209095; Dec. 26, 1981, 56-210617; Dec. 28, 1981, 56-215782; Dec. 28, 1981, 56-215783; Dec. 28, 1981, 56-215784

Int. Cl.⁴ B43L *13/16*

U.S. Cl. 33—20.1 **3 Claims**



1. A method of depicting a contour of a three-dimensional object, comprising the steps of:

forming a virtual image of the three-dimensional object to be depicted by means of a total reflection mirror and a semi-transparent mirror which is inclined with respect to a predetermined direction of observation by two eyes, across a display medium, the object being disposed on one of the reflection and transmission sides of the semi-transparent mirror with respect to the predetermined position of observation by two eyes and the display medium being disposed on the other of the reflection and transmission sides of the semi-transparent mirror with respect to the position of observation; and

moving the virtual image of the object relative to the display medium in a direction of depth of the display medium, and tracing a point of intersection between the surface of the virtual image of the object and the display medium.

3. A method of depicting a rotating object, comprising the steps of:

forming a virtual image of at least a portion of the rotating surface of a rotating object to be depicted on a display medium by means of a semi-transparent mirror which is inclined with respect to a predetermined direction of observation by two eyes, said rotating object being disposed on one of the reflection and transmission sides of the mirror with respect to the predetermined position of observation by two eyes and said display medium being disposed on the other of the reflection and transmission sides of the mirror;

moving the display medium in a predetermined synchronous manner with the image of said portion of the rotating surface; and

tracing at least one of a contour and a pattern of the image of said portion of the rotating surface on said display medium.

4,571,836

PANTOGRAPH

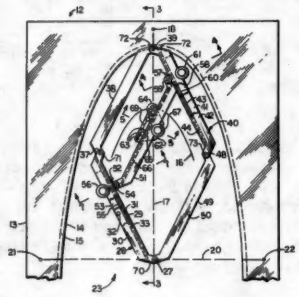
Marian Poll, 1271 N.W. Hwy., Park Ridge, Ill. 60068

Filed Mar. 7, 1985, Ser. No. 709,296

Int. Cl.⁴ B43L *13/10*

U.S. Cl. 33—25 B **2 Claims**

1. A drafting instrument for tracing ellipses and other curves, adapted for the use with suitable templates of such curves, said templates having a recess at its cutout edges to receive a stem disc to prevent upward movement of the instrument, said instrument comprising left and right C-shaped slide supporting links, left and right C-shaped bare links whose one ends are pivotally connected to said left slide supporting link and whose other ends are pivotally connected to said right slide supporting link, said left and right slide supporting links and said left and right bare links are of equal length and being disposed in parallel to constitute two pairs of opposite sides of rhombus link mechanism having first and opposite second vertexes, a needle point support secured to said link mechanism



in said first vertex and a stem secured in said second opposite vertex, said stem being constrained along the cutout edge of a template and a pair of linkage supporting legs, said rhombus link mechanism also includes means for guiding a stylus, said means including two sliding members respectively supported in the slide supporting links, designed to be secured at any selected point therein, a transverse C-shaped link pivotally connected at each end to said sliding members and interchangeable stylus guide member supported by said transverse link, designed to be secured to said link at any selected point for manual guiding said stylus along a curvilinear path for retracing said curve on the graphic surface.

4,571,837

ELLIPSOGRAPH

Tien-Fu Cheng, 14, Pei Shan Road, Pei Shan Li, Hsi Chih City Tapei Hsien, Taiwan (221), and Lung-Chiao Chou, 1, Alley 9, Lane 250, Cheng Kung Rd., Sec. 2, Nei Hu, Taipei, Taiwan (114)

Filed Aug. 3, 1984, Ser. No. 637,199

Int. Cl.⁴ B43L *11/04*

U.S. Cl. 33—30.1 **6 Claims**

1. An improved ellipsograph for drawing ellipses, ovoids and circles of various size and proportion comprising:

(a) a rectangular base frame having a slot at a bottom portion thereof formed in the direction of its width and further having an inner margin;

(b) a positioning plate slidably mounted thereupon, and extendible in the direction of the longer side of said base frame;

(c) a slide block having a circular central opening slidably mounted upon the inner margin of said frame;

(d) a battery holder affixed to one end of said frame;

(e) a worm gear wheel having a slot parallel to a diameter;

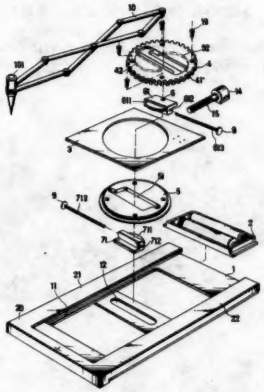
(f) a planar disc having a slot parallel to a diameter, said disc and said worm gear wheel being affixed to each other so that said slots are parallel and being rotatably mounted in the circular opening of the slide block;

(g) an adjustable pivot block having a projecting pivot fitted in said slot of said worm wheel, and being adjustable along the length of said slot;

(h) an adjustable stub block having a projected stub fitted in

said slot of said disc and adjustable along the length of said slot, said stub projecting into said slot of said base frame;

(i) a drawing arm adjustable in length and having a holder for a drawing instrument, said arm being fixed to said pivot; and



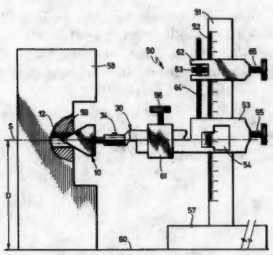
(j) a motor mounted upon one side of said slide block, said motor being connected to said battery holder by conductive wires and driving a shaft in mesh with said worm gear wheel.

4,571,838

DIRECT READOUT CENTERLINE MEASURING DEVICE AND PROCESS

Wesley Stout, III, 228 S. Green St., Apt. A, Brownsburg, Ind. 46112

Filed Apr. 18, 1984, Ser. No. 601,615
Int. Cl.[4] G01B 5/25
U.S. Cl. 33—169 C 5 Claims



1. A direct readout center line measuring device comprised of generally triangular shaped tool having two intersecting surfaces with a generally conical configuration ending in a point, and the third intersecting surface being flat; a cylindrical stem attached to said third surface, the center line of said cylindrical stem being in alignment with the point of intersection of said first two surfaces, said cylindrically shaped stem being adpated for mounting in a moveable slide of a height measuring gage assembly.

4,571,839

BORE GAUGES

Barrie C. Burton, Rugby, United Kingdom, assignor to System E Controls Limited, Leamington Spa, England

Continuation of Ser. No. 466,963, Feb. 16, 1983, abandoned. This application May 14, 1984, Ser. No. 609,529
Claims priority, application United Kingdom, Feb. 16, 1982, 8204467
Int. Cl.[4] G01B 5/12, 7/12, 3/26
U.S. Cl. 33—178 E 11 Claims

1. A bore gauge comprising an electrical transducer, a protective shroud and a handle, said transducer comprising a one-piece resilient fork-like structure formed from a single solid piece of spring steel plate by a machining operation without deformation and comprising two flexible limbs and a plug-shaped tail portion of transverse dimension not greater than the lateral span across said limbs, two gauging contacts, one of said gauging contacts being carried on each of said limbs, and a multi-turn coil and core, said core being mounted for movement within said coil, and said coil and said core each being movable with one of said gauging contacts, said shroud having a cylindrical outer portion adapted for insertion into the bore to be gauged and having a hollow interior, said hollow interior having a forward part, and a rear part comprising an axial bore detachably receiving and locating said tail portion of said transducer so that said transducer lies wholly within said hollow interior with said flexible limbs occupying the forward part thereof and said gauging contacts protruding laterally beyond said outer portion of said shroud for engagement with a wall of the bore to be gauged, and said shroud having a rearwardly extending plug portion to the rear of said outer portion and said bore, and a releasable fastening between said plug portion and said handle.

4,571,840

DEPTH-OF-CUT GAUGE

Jim May, 10751 SE. 258th Pl., Gresham, Oreg. 97030

Filed Aug. 10, 1984, Ser. No. 639,342
Int. Cl.[4] G01B 3/22, 5/00
U.S. Cl. 33—185 R 3 Claims

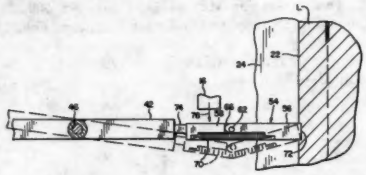
1. A depth of cut gauge for working members of the type having a supporting frame, a carriage movable longitudinally on said frame, means supporting said frame longitudinally of a workpiece, and means arranged to adjust said frame laterally of the workpiece for positioning the carriage in a depth of cut on the workpiece said gauge comprising

an arm member having opposite ends,

one end of said arm member comprising an abutment edge for engaging a workpiece in establishing a depth of cut,

mounting means on said arm member arranged to pivotally mount it on a supporting frame of a working member,

and biasing means urging said arm member laterally of the frame of a working member to position said abutment edge toward a workpiece but to allow said arm member to be swung out of the way of a carriage as the latter passes by,



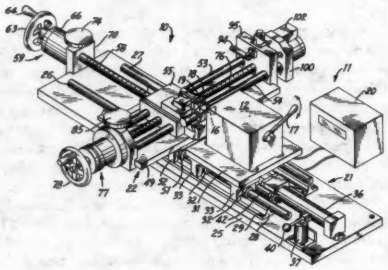
said arm member being pivotally jointed intermediate its ends whereby to be capable of partially folding and releasing said abutment edge from a stuck position in a workpiece.

4,571,841

TOOL PRE-GAUGING DEVICE

Michael E. Campbell, Farmington Hills, Mich., assignor to General Electric Company, Detroit, Mich.

Filed Mar. 20, 1984, Ser. No. 591,356
Int. Cl.[4] B27G *23/00*
U.S. Cl. 33—185 R **8 Claims**



1. A system for pregauging cutting tools to ascertain their offsets relative to a master cutting tool comprising:

a pair of spaced parallel rails mounted on a base;

a platform slidably mounted on said pair of spaced parallel rails;

means for releasably holding a cutting tool to be gauged, said means being mounted on said platform;

means for advancing and retracting said platform with said holding means from a position for loading and unloading the cutting tool to and from a position for gauging the cutting tool;

electronic gauging means for taking a measurement of a cutting tool along two axes which are perpendicular to each other and for providing a digital readout of the measurements for each axis;

means for advancing said electronic gauging means to contact a master cutting tool in the gauging position to provide reference measurements and for locking said advancing means after such measurements have been made; and

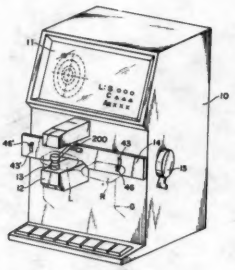
means for retracting said electronic gauging means a limited distance and independent of said electronic gauging advancing means after measurements of the master tool and for advancing said electronic gauging means for measuring offsets of a cutting tool in the gauging position relative to the measurements of the master tool.

4,571,842

LENS JUDGING APPARATUS OF LENS METER

Yukio Ikezawa, and Hisakazu Yoshino, both of Tokyo, Japan, assignors to Tokyo Kogaku Kikai Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 10, 1984, Ser. No. 660,423
Claims priority, application Japan, Oct. 15, 1983, 58-158650[U]
Int. Cl.[4] A61B *3/10*; G01B *9/00*
U.S. Cl. 33—200 **4 Claims**



1. In a lens judging apparatus to be used in a lens meter for measuring refraction characteristic of a spectacles lens by holding the spectacles on a lens receiving stand and a lens table with said lens receiving stand arranged generally in the center thereof with respect to the elongated direction, the lens judging apparatus comprising:

at least one projecting member movably mounted on the both sides of the lens table with respect to the elongated direction in such a manner as to be movable within a predetermined range in the traversing direction relative to said elongated direction by receiving said respective spectacles hung thereon;

means for detecting the movement of said projecting member;

means for judging whether the spectacles lens put on said lens receiving stand is for the right or left by means of a detecting signal emitted from said detecting means; and

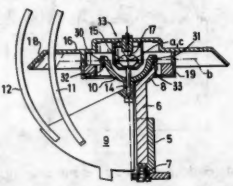
means for informing the results of the judgement made by said judging means to the measurer.

4,571,843

DEVICE FOR PREVENTING ERROR IN A COMPASS

Clas G. Lindskog, Sollentuna, Sweden, assignor to Instrumentverken Aktiebolag, Sollentuna, Sweden

Filed Sep. 5, 1984, Ser. No. 647,421
Claims priority, application Sweden, Sep. 9, 1983, 8304852
Int. Cl.[4] G01C *9/00, 17/02*
U.S. Cl. 33—355 R **2 Claims**



1. A compass for preventing error or misreading fastened to a sloping plane of a boat, the compass comprising a spherical casing, a pendulum mounted for limited pivoting movement in a first plane inside said casing, a sealed compass disk having a mounting point rotatably and pivotally mounted on said pen-

dulum, a steering line on said pendulum, said sealed disk being intended to be read at an angle of 0° to about 45° relative to a horizontal plane, a cradle pivotably mounted inside and to the spherical casing for movement relative the spherical casing in a second plane substantially at right angles to said first plane, said pendulum being mounted in said cradle for pivoting movement thereon in said first plane, the steering line of the pendulum and said mounting point for said disk on the pendulum being continuously maintained by the action of gravity in the same vertical plane relative the fore-and-aft line of the boat independent of the heeling of the boat.

4,571,844

ANGLE CHANGE DETECTOR

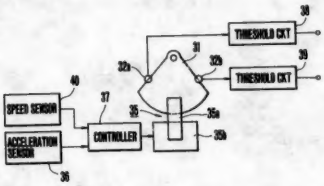
Seiichi Komasaku, Yokohama; Hiroshi Iiyama, Yokosuka; Noboru Watanabe, Tokyo, and Osamu Tanaka, Kawasaki, all of Japan, assignors to Jeco Co., Ltd., Kanagawa, Japan

Filed Jun. 8, 1983, Ser. No. 502,087

Claims priority, application Japan, Jun. 9, 1982, 57-85633[U]; Jun. 28, 1982, 57-97171[U]; Aug. 6, 1982, 57-119642[U]; Aug. 26, 1982, 57-128864[U]

Int. Cl.⁴ G01C *9/06, 9/12*

U.S. Cl. 33—366 **2 Claims**



1. An angle change detector comprising:

a swingable pendulum of an electroconductive non-magnetic material;

means for applying magnetic flux to the pendulum; and

means for detecting the rotation of the pendulum;

wherein said magnetic flux applying means comprises a pair of opposing magnets supported by a magnetic plate frame, said pendulum is pivotally mounted to the magnetic plate frame, said pendulum is pivotally mounted to the magnetic plate frame to swing past a spacing between the opposing magnets, and said detecting means comprises two photosensors disposed near opposite side edges of said pendulum and adjustable threshold circuits respectively connected with the two photosensors to produce an output signal when an output signal from the photosensor exceeds a predetermined selectable threshold level.

4,571,845

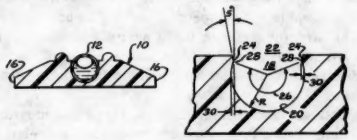
POLYCAST LEVEL INSTRUMENTS WITH MEANS FOR RETAINING LEVEL VIALS THEREIN

Randall J. Wright, 3535 Studio Ct., Brookfield, Wis. 53005, and Donald Wright, 14265 Juneau Blvd., Elm Grove, Wis. 53202

Filed Jan. 30, 1984, Ser. No. 574,877

Int. Cl.⁴ G01C *9/28*

U.S. Cl. 33—379 **21 Claims**



1. In a plastic level instrument or other hand tool having a plastic body portion with a cylindrical level measuring vial therein and a measuring surface, the improvement comprising means integrally formed with said body portion for aligning and retaining the level vial of predetermined radius and length within said body portion in predetermined angular relationship to said measuring surface, said means including a recess defined by a semi-cylindrical surface formed in said body portions, the longitudinal axis of the recess being oriented in precise angular relationship to the measuring surface, the length of the recess along its longitudinal axis being equal to or greater than the length of the level vial, the surface of said recess having a radius substantially equal to the radius of the vial and having an arc greater than 180 degrees and less than 360 degrees, a pair of opposed longitudinal ridges defined by the edges of the cylindrical surface, a vial receiving and viewing opening defined between the opposed ridges wherein the vial may be inserted into the recess through the opening and securely retained by the recess and ridges in precise orientation to the measuring surface without additional retention means.

4,571,846

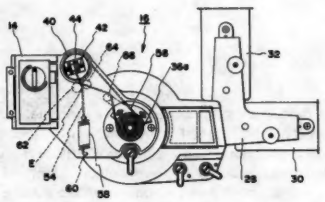
SCALE BALANCING DEVICE IN UNIVERSAL PARALLEL RULER DEVICE

Hideo Mikuriya, c/o Mutoh Industry, Ltd., 3–1–3, Ikejiri, Setagaya-ku, Tokyo, Japan

Filed Jan. 9, 1985, Ser. No. 689,899

Int. Cl.⁴ B43L *13/02*

U.S. Cl. 33—438 **3 Claims**



1. A scale balancing device for balancing the weight of the scales of a universal parallel ruler, said device comprising a head structure having a rotating scale support rotatably mounted thereon on which said scales are carried, a rotating member rotatably mounted on said head structure offset from said rotating support, means rotatably interlocking said rotating member and said scale support, an eccentric member on said rotating member and having a portion projecting axially of said rotating member beyond the axial end surface of said rotating member, and a spring member having one end connected to said projecting portion and the other end connected to said head structure and tensioned for providing a torque on said rotating member in a direction which substantially cancels out the torque on said rotating member from the weight of the scales, whereby during rotation of the rotating member through 360 degrees, the one end of the spring member can continuously engage the projecting portion of said eccentric member and the spring member is not hooked by the rotating member.

4,571,847

METHOD AND APPARATUS FOR USE IN CO-ORDINATE MEASURING MACHINES

David R. McMurtry, Gloucestershire, England, assignor to Rolls-Royce Ltd. and Renishaw plc, both of Bristol, England

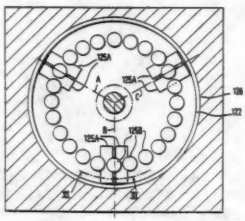
Continuation of Ser. No. 545,583, Oct. 25, 1983, abandoned, which is a continuation of Ser. No. 309,095, Oct. 6, 1981, abandoned, which is a continuation of Ser. No. 67,554, Aug. 17, 1979, Pat. No. 4,313,263, which is a division of Ser. No. 872,312, Jan. 25, 1978, Pat. No. 4,168,576. This application Dec. 4, 1984, Ser. No. 678,363

Claims priority, application United Kingdom, Feb. 7, 1977, 5010/77

The portion of the term of this patent subsequent to Feb. 2, 1999, has been disclaimed.

Int. Cl.[4] G01B 5/03, 7/03

U.S. Cl. 33—503 3 Claims



1. A device for mounting a tool in a machine, the tool having a supported end and a free end which, in use, performs an operating function, said device comprising a first member adapted to be secured to the machine, a second member to which said supported end is connected, the members having an axis, one of the members having a group of more than three first support elements arranged about said axis, the other member having a group of only three second support elements arranged about said axis, the members being relatively rotatable about said axis to establish approximate axial alignment between said three second elements and a selected three of the first elements, the first elements having seat surfaces, the second elements having seat surfaces confronting the seat surfaces of the first elements when the alignment is established, the members being movable relatively axially to establish engagements between confronting ones of said surfaces of the first and second elements, the surfaces of the elements of one of said groups defining pairs of convergent surfaces on which the surfaces of the elements of the other group are seatable during the engagements thereby to locate the members positively on the other and determine the angular and radial relationship of the members, and the surfaces of the elements of each of said groups are convex in respective first planes perpendicular to respective second planes through said axis, and the surfaces of the elements of at least one of the groups are additionally convex in respective said second planes.

4,571,848

APPARATUS FOR MEASURING THE TRANSVERSE PROFILE OF A DRILL HOLE IN A GEOLOGIC FORMATION

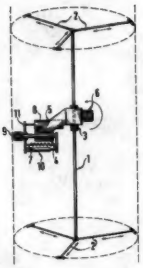
Ferdinand Krütz; Jürgen Keck, both of Jülich; Johann Bölingen, Aachen, and Herbert Wetzler, Brunsum, all of Fed. Rep. of Germany, assignors to Kernforschungsanlage Jülich Gesellschaft mit beschränkter Haftung, Jülich, Fed. Rep. of Germany

Filed Jan. 14, 1985, Ser. No. 691,457

Claims priority, application Fed. Rep. of Germany, Jan. 12, 1984, 3400834

Int. Cl.[4] G01B 7/28

U.S. Cl. 33—544 5 Claims



1. Apparatus for determining the profile of bore holes in geological formations comprising:

two centering devices axially spaced from each other by an elongate spacing member;

a rotary mount constituted at least in part by said spacing member and having a longitudinal axis running through said spacing member on which said rotary mount is centered which connects the centers of the centering devices;

a measuring arm held on said rotary mount extending radially from said axis;

means for controllably moving said measuring arm about said axis, and

electrical means for measuring the extension length of said measuring arm from said axis to the tip of said arm remote from said axis, said apparatus including the improvement which comprises:

two parts constituting said measuring arm which are mutually displaceable with respect to each other and an elastic element providing elastic force against which said two parts are mutually displaceable, the direction of said mutual displacement being substantially radial with respect to said axis,

said respectively displaceable parts (4, 11) of said measuring arm being respectively directly connected to relatively movable parts of said electrical measuring means, whereby an output signal of said electrical measuring means constitutes a measure for the radius of said bore at the location of said measuring arm.

4,571,849
APPARATUS FOR REMOVING LIQUID FROM THE GROUND

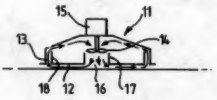
Philip D. Gardner, Myrtle Cottage, Wiveton, Holt; Robin H. Combe, Glandford Mill, Glanford, Holt; John H. Groom, 12 The Green, Binham, Fakenham, and Kenneth J. Groom, Pausan, Ling Common, Coltishall, Norwich, all of Norfolk Island

Filed Oct. 15, 1984, Ser. No. 661,083

Claims priority, application United Kingdom, Oct. 22, 1983, 8328299; May 18, 1984, 8412778

Int. Cl.[4] F26B *9/00*

U.S. Cl. 34—79 **6 Claims**



1. A machine for removing liquid from an area of ground over which the liquid has spread, the machine comprising:

(a) a hood with a peripheral edge, essentially unapertured and generally dished to define in use the top and sides of the machine;

(b) a tray, generally flat, with a peripheral edge and an aperture at its centre;

(c) means mounting the tray within the hood such that the underside of the machine is defined by the tray, and that an annular gap is maintained between the peripheral edge of the tray and the peripheral edge of the hood;

(d) a motor driven fan mounted at a center portion of, and inside, the hood for blowing air down the central aperature and for drawing substantially all the said air up through the annular gap and across the inside of the hood in a continuous path;

(e) a wall, formed at the peripheral edge of the central aperture and rising towards the fan to duct the fan-blown air through the aperture and across the underside of the machine towards the annular gap;

(f) another wall, formed around the tray peripheral edge and rising therefrom to duct the air entering the annular gap upwardly towards the underside of the hood;

(g) a chamber, defined between the tray walls, to receive liquid drawn with the air into the annular gap and carried over the tray's peripheral wall; and

(h) means maintaining a passage for the in-drawn air to blow over the top of the peripheral tray wall across the inside of the machine and into the fan.

4,571,850
CENTRIFUGAL WAFER PROCESSOR

James R. Hunt, Westminster, and Russell P. Balent, Fountain Valley, both of Calif., assignors to The Fluorocarbon Company, Anaheim, Calif.

Filed May 17, 1984, Ser. No. 611,522

Int. Cl.[4] F26B *25/00, 11/02;* **F27D** *1/18*

U.S. Cl. 34—242 **20 Claims**

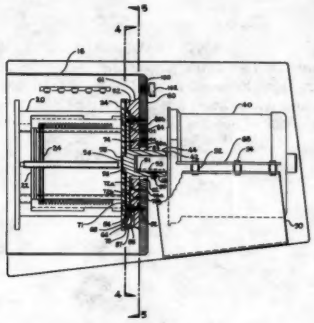
1. An apparatus for processing carriers of semi-conductor wafers and glass photomask plates, comprising:

a rotatable frame configured to releasably hold a carrier;

a motor connected to the rotatable frame in a direct drive manner to rotate the frame;

a container enclosing the rotatable frame, the container having an aperture through which the rotatable frame is connected with the drive motor, the container not contacting the rotatable frame or the drive motor;

means for providing a positive pressure gas seal between the container and the connection between the rotatable frame and the drive motor, the gas seal providing a positive pressure which prevents contaminants from passing through the seal into the inside of the container, the gas



seal further providing a positive pressure to the inside of the container.

4,571,851
SLIPPERS

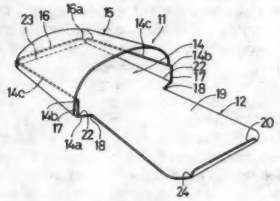
Masao Yamada, Akishima, Japan, assignor to Tama Pack Co., Ltd., Tokyo, Japan

Filed Jul. 26, 1984, Ser. No. 634,819

Claims priority, application Japan, Apr. 14, 1984, 59-55298[U]; Jun. 18, 1984, 59-126191

Int. Cl.[4] A43B *3/12, 1/02*

U.S. Cl. 36—11.5 **7 Claims**



1. A slipper comprising a sole defined by an outlined edge and having a predetermined length from a front end to a back end thereof, said sole being composed of a toe portion of a predetermined width defining the front end thereof, a foot inserting part having opposite side edges defining a predetermined minimum width longitudinally spaced from said front end and progressively and symmetrically enlarged to a predetermined maximum width toward the back end of said sole, said foot inserting part having pressed bend lines extending slightly inside and along said opposite side edges thereof respectively to define opposite marginal parts which may be spontaneously bent up when pressed toward each other, said sole having a reduced part connected to said maximum width of said foot inserting part, said reduced part having edges extending at an acute angle from both sides of said maximum width toward the back end of the sole, a heel part progressively enlarged from said reduced part toward the back end of said sole and defining a maximum width adjacent said back end, and an instep arranged on said foot inserting part in a strained condition, said instep being made of a film material and having both sides adhered to said opposite marginal parts of said foot inserting part, said length of said sole being of a dimension aproximately twice as large as that of said maximum width of said foot inserting part when the latter remains flat, said toe portion having a width of a dimension approximately a half of that of said maximum width of said foot inserting part, and said maximum width of said heel part being of a dimension

larger than that of said maximum width of said foot inserting part when said opposite marginal parts are pressed toward each other and spontaneously bent up.

4,571,852

ANTI-SKIDDING SOLE

Raymond B. Lamarche, Acton Vale; Baldev Bhandari, Granby; Rémi Desaultels, and Pierre Drolet, both of Acton Vale, all of Canada, assignors to Les Caoutchoucs Acton Ltee, Canada

Continuation of Ser. No. 422,702, Sep. 24, 1982, abandoned. This application Sep. 11, 1984, Ser. No. 649,961

Int. Cl.[4] A43B *13/00, 13/04*

U.S. Cl. 36—32 R **12 Claims**

1. An anti-skidding sole for boot or shoe, said sole being made of rubber or similar material and having a longitudinal axis and a lower surface comprising a metatarsal part and a heel part, wherein:

said lower surface comprises a first set of integral, rib-like members covering the entire surface of the metatarsal part of the sole and a second set of integral, rib-like members covering the entire surface of the heel part of said sole;

the rib-like members of said first and second sets have an identical, trapezoidal cross-section and comprise raised contact surfaces which altogether form a flat, overall bottom surface, across an arch area of the sole;

the rib-like members of the first set extend in a regular manner at a constant, radial distance from each other without closing up on themselves all around a first central point located on the longitudinal axis of the sole substantially in the middle of the metatarsal part of said sole; and

the rib-like members of the second set extend in a regular manner at a constant, radial distance from each other without closing up on themselves all around a second central point located on the longitudinal axis of the sole substantially in the middle of the heel part of said sole, each of said rib-like members defining a plurality of anti-skidding edges evenly aligned circumferentially to said first and second central points in every direction from said central points to oppose a frictional force substantially identically in any direction to any skidding motion while simultaneously allowing air boxed-up under said sole to escape thereby avoiding formation of an air cushion.

4,571,853

SHOE INSERT

Walter A. Medrano, Rte. 2, Box 3146, Norwood, N.C. 28128

Filed Jun. 4, 1984, Ser. No. 616,856

Int. Cl.[4] A43B *13/40*

U.S. Cl. 36—43 **2 Claims**

1. A shoe insert, comprising:

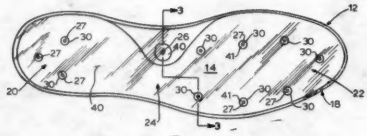
(a) an envelope of air impervious transparent thin plastic film material, said envelope, as seen in plan, tracing the outline of a human foot with a heel zone, a forward zone and an intermediate zone;

(b) said envelope having upper and lower walls and a side wall joining said upper and lower walls;

(c) said upper wall having in said intermediate zone a first hole therethrough of a first diameter and in said heel and forward zones second plural holes of a second diameter less than said first diameter;

(d) an opaque pattern printed on the inside surface of said upper wall and defining with unprinted portions thereof the location of said first and second holes; and

(e) a flat pad of cushioning foam material in said envelope confined between said upper, lower and side walls, said pad of cushioning foam material having in registry with said first hole in said upper wall a third hole passing there-



through and in registry with said second plural holes fourth plural holes passing therethrough,

whereby as the wearer of said shoe insert walks and asserts pressure on said heel zone air is forced into said forward zone and expelled through said first hole in said intermediate zone and said second plural holes in said forward zone followed as said wearer asserts pressure on said forward zone by air being forced into said heel zone and expelled through said first holes in said intermediate zone and said second plural holes in said heel zone.

4,571,854

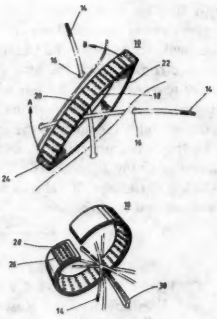
KNOT LATCH DEVICE

Robert B. Edens, Houston, Tex., assignor to Her Investments, Houston, Tex.

Filed Apr. 22, 1983, Ser. No. 487,844

Int. Cl.[4] A43B *11/00*; F16G *11/00*

U.S. Cl. 36—50 **3 Claims**



1. A knot latch device adapted to secure a lace member, comprising:

a flexible upper member having first and second ends and first and second faces;

a flexible lower member having first and second ends and first and second faces, said first and second ends of said lower member being connected to said first and second ends of said upper member, respectively, said second faces of said upper and lower members being adjacently disposed and defining structure adapted to receive said lace member;

first releasable locking structure included on at least a portion of said first face of said upper member; and

second releasable locking structure included on at least a

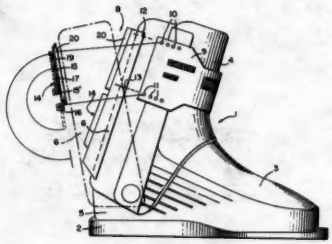
portion of the first face of said lower member and adapted to mate with said first releasable locking structure.

4,571,855

INTEGRATED CLOSURE SYSTEM FOR A SKI BOOT

Roger Blanc, Izeaux, France, assignor to Salomon S.A., Annecy, France

Filed Nov. 21, 1983, Ser. No. 553,888
Claims priority, application France, Nov. 24, 1982, 82 19676
Int. Cl.[4] A43C *11/00*; A43B *5/04*
U.S. Cl. 36—50 **27 Claims**



1. An integrated closure system for a ski boot, said ski boot comprising two portions adapted to be drawn together by said closure system, said closure system comprising:

(a) at least one traction cable adapted to be connected at one of its ends to a location provided on at least one of said two portions; and

(b) a traction assembly comprising a cable stretcher and a return element adapted to be mounted on one portion of the boot, said cable stretcher being activated by a control element which can assume at least two positions, namely, an open position in which it frees a length of said traction cable to allow for the opening of the boot, and a closed position in which said traction cable is subjected to a tractional force to draw said two portions towards one another, and wherein closure of said closure element occurs along the direction of closure of said portion on which said cable stretcher is mounted, said return element being adapted to transfer the tractional force exerted on the at least one traction cable by the cable stretcher along an appropriately selected direction to assure good closure of the boot.

4,571,856

DOUBLE LACED ATHLETIC SHOE

Yung-Mao Lin, Taichung, Taiwan, and James C. Autry, Dallas, Tex., assignors to Autry Industries, Inc., Dallas, Tex.

Filed May 21, 1984, Ser. No. 612,720
Int. Cl.[4] A43B *7/20, 7/14, 5/00, 7/08*
U.S. Cl. 36—89 **10 Claims**

1. An athletic shoe comprising:

a sole portion for disposal adjacent the sole of the wearer's foot;

an upper secured about the periphery of said sole portion and cooperating with said sole portion to enclose the foot;

an inner support covering positioned adjacent the inside surface of said upper and secured to said sole portion for disposal about the ankle of the foot and between the foot and said upper comprising:

a lateral portion attached to said sole portion from a point adjacent the cuboid bone to a point adjacent the shaft of the fifth metatarsal bone and extending upwards over the outer malleolus and the lateral side of the dorsum of the foot;

a medial portion attached to said sole portion from the back of the arch to the front of the arch and extending upwards over the inner malleolus and the medial side of the dorsum of the foot;

an achilles portion disposed adjacent said lateral portion and said medial portion extending rearwardly about the leg and ankle above the attachment point of the achilles tendon, such that the calcaneum bone is exposed;

a first medial reinforcing strip secured to said medial portion, attached to said sole at a point corresponding to the back of the arch and extending vertically over the inner malleolus;

a second medial reinforcing strip secured to said medial portion, attached to said sole at a point corresponding to the front of the arch and extending vertically over the shaft of the metatarsal bones;

a first lateral reinforcing strip secured to said lateral portion, attached to said sole at a point opposite said first medial reinforcing strip and extending vertically over the outer malleolus; and

a second lateral reinforcing strip secured to said lateral portion, attached to said sole at a point opposite said second medial reinforcing strip and extending vertically over the shaft of the metatarsal bones; and

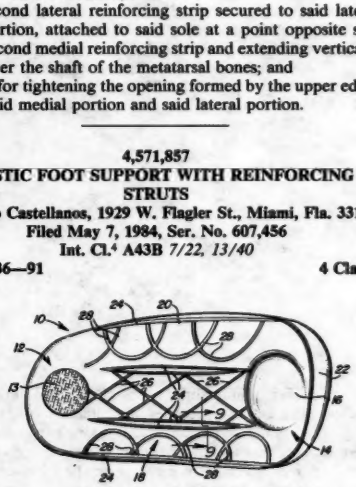
means for tightening the opening formed by the upper edges of said medial portion and said lateral portion.

4,571,857

PLASTIC FOOT SUPPORT WITH REINFORCING STRUTS

Rigoberto Castellanos, 1929 W. Flagler St., Miami, Fla. 33135

Filed May 7, 1984, Ser. No. 607,456
Int. Cl.[4] A43B *7/22, 13/40*
U.S. Cl. 36—91 **4 Claims**



1. A foot support for use in an article of footwear comprising a sheet of molded polypropylene plastic shaped to fit the foot and having a heel area, a metatarsal area, and an arch area with an elevated arch-supporting section between and merging into the heel and metatarsal area, the support being formed with integral reinforcing ribs extending at least across the arch-supporting section of the arch area, wherein the ribs include longitudinal reinforcing ribs spaced from longitudinal edges of the support, criss-cross reinforcing ribs extending between the longitudinal ribs, and longitudinal series of intersecting semi-circular reinforcing ribs along the longitudinal edges of the support the ends of each semi-circular rib terminating at the respective edge of the support.

4,571,858

SKI SHOE SOLE

Antonio Faulin, Via Giovanni da Procida 4, Milano, Italy

Filed Feb. 7, 1984, Ser. No. 577,937
Claims priority, application Italy, Feb. 21, 1983, 19671 A/83
Int. Cl.[4] A43B *5/04*
U.S. Cl. 36—117 **7 Claims**

1. A sole of a ski shoe, comprising:

(a) a body of relatively pliable material and having a crosswise cutout in the under surface of its toe portion;

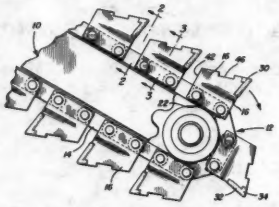
(b) a reinforcing element embedded in the body, of a material stiffer than the body, extending from the heel to the toe area of the sole, the reinforcing element being substantially narrower than the width of the sole, and having a rear recess opening at the heel for engagement with the pusher element of a rear automatic release assembly of a ski binding and being provided with engagement means projecting into said crosswise cutout for engagement with a front automatic release assembly of the ski binding, the reinforcing element tapering from the heel to the toe area down to a thickness such that the toe portion of the sole has a substantial degree of flexibility.

4,571,859

NOTCHED DITCHER CHAIN TOOTH

Douglas A. Leischer, Box 375, Pierre, S. Dak. 57501

Filed Jan. 7, 1984, Ser. No. 689,558
Int. Cl.[4] E02F *9/28*
U.S. Cl. 37—191 A **8 Claims**



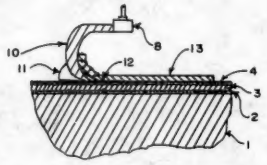
1. A ditcher chain tooth for use, in right- and left-hand configuration, on opposite sides of a ditcher chain, said tooth being of the cupped-type and including a plate member having opposite inner base and outer free marginal portions as well as front and rear marginal portions extending between corresponding front and rear ends of said inner and outer marginal portions, said inner marginal portion being substantially planar and defining a medial plane, the front marginal portion, extending from said inner marginal portion toward said outer marginal portion and initially abruptly curving outwardly of one side of said plane and thereafter more gradually curving inwardly toward said plane, said rear marginal portion, outwardly of said inner marginal portion, being slightly angled outwardly of said one side of said plane toward said outer marginal portion, said outer marginal portion being slightly forwardly and outwardly inclined to said one side of said plane and forwardly and upwardly inclined away from said inner marginal portion, said outer marginal portion including an elongated outwardly opening notch formed therein spaced generally one-third of the length of said outer marginal portion from both the front and rear ends of said outer marginal portion.

4,571,860

METHOD AND APPARATUS FOR REMOVING ICE FROM PAVED SURFACES

Howard W. Long, 3436 Upland Dr., Anchorage, Ak. 99504

PCT No. PCT/US82/01622, § 371 Date Jul. 18, 1983, § 102(e) Date Jul. 18, 1983, PCT Pub. No. WO83/01798, PCT Pub. Date May 26, 1983
PCT Filed Nov. 17, 1982, Ser. No. 514,778
Int. Cl.[4] E01H *5/00*
U.S. Cl. 37—197 **22 Claims**



1. The method for removing ice from a pre-prepared pavement having an ice cover thereon, comprising the steps of:

(a) preparing the pavement by application to said pavement of a thin multi-layer top coat wear-resistant material comprising a microwave absorptive carbonaceous material layer and an aluminum containing underlayer material;

(b) passing a microwave generator and a cooperating waveguide over said pre-prepared pavement having ice cover thereon, said generator generating microwaves at a frequency permitting the microwaves to pass through said ice cover and to be absorbed by said microwave absorptive material at the interface between said thin multi-layer top coat wear-resistant material and said ice and said waveguide passing with sufficient speed to cause said interface to be heated without substantially warming the underlying pavement to thereby cause said ice to be rapidly released from said thin multi-layer top coat wear resistant material at said interface only; and,

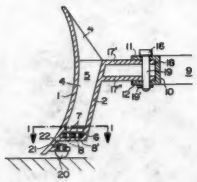
(c) scraping said ice from said thin multi-layer top coat wear-resistant material prior to said ice refreezing to said thin multi-layer top coat wear-resistant material.

4,571,861

BULLDOZING OR SNOWPLOW BLADE

Manfred Klever, and Karl-Heinz Rott, both of Saarbruecken, Fed. Rep. of Germany, assignors to Gutbrod-Werke GmbH, Saarbruecken-Buebingen, Fed. Rep. of Germany

Filed Mar. 15, 1984, Ser. No. 589,705
Claims priority, application Fed. Rep. of Germany, Mar. 19, 1983, 3310062
Int. Cl.[4] E01H *5/00*
U.S. Cl. 37—241 **11 Claims**



1. A snow clearing blade construction as an attachment for a motorized device, comprising a snow clearing blade member (1) having a given horizontal blade length, a blade reinforcing

wall member (2) having a horizontal wall length corresponding substantially to said given blade length, means including side walls operatively connecting said reinforcing member to the rear of said snow clearing blade member with a spacing between said clearing blade member and said reinforcing wall member, said snow clearing blade member and said wall member forming a double-walled upwardly open container corresponding in length substantially to said given horizontal blade length for increasing the rigidity in an area of power application to said clearing blade construction, a bottom wall closing said double-walled container downwardly, holes in said bottom wall for using said double-walled container as a spreader for granular material, a closure member (6) arranged for cooperation with said bottom wall for temporarily closing said holes in said bottom wall, and wherein said double-walled container is an injection molded one-piece integral structural unit forming a spreading funnel into which said granular material can be filled from the top for spreading downwardly directly behind said snow clearing blade member, substantially over its entire horizontal blade length.

4,571,862

ELECTRIC STEAM IRON

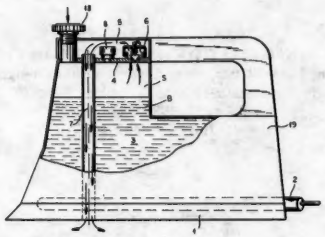
Giancarlo Costa, Milan, Italy, assignor to Olimpic Di Costa Lorenzo & C. S.N.C., Milano, Italy

Filed Sep. 26, 1984, Ser. No. 654,816

Claims priority, application Italy, Sep. 28, 1983, 23096/83[U]

Int. Cl.[4] D06F *75/16*

U.S. Cl. 38—77.81 **4 Claims**



1. An electric steam iron comprising:

a sole plate;

a housing carried on the sole plate and defining a substantially closed chamber adapted to hold a body of water;

means for heating the water in the chamber to above 100° C.;

means including a valve at the chamber for maintaining the chamber under superatmospheric pressure, whereby superheated steam is produced therein by the heating means;

a conduit extending between the chamber and the sole plate for conducting this superheated steam to the sole plate, the water chamber being above the sole plate and the housing forms another chamber constituting part of the conduit and in turn above the water chamber, the valve being between the chambers and only permitting fluid flow into the upper chamber from the water chamber when the pressure in the water chamber is above a predetermined superatmospheric level, the rest of the conduit being formed by a tube that extends vertically through both chambers and has an upper and opening into the upper chamber and a lower end opening downward through the sole plate.

4,571,863

GAS OPERATED SMOOTHING IRON

Howard O. Freckleton, and John S. Bird, both of 5 Inverness Mews, London, England (W2 3JQ)

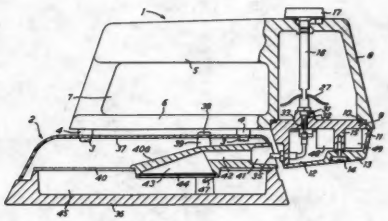
PCT No. PCT/GB83/00267, § 371 Date May 15, 1984, § 102(e) Date May 15, 1984, PCT Pub. No. WO84/01589, PCT Pub. Date Apr. 26, 1984

PCT Filed Oct. 19, 1983, Ser. No. 610,989

Claims priority, application United Kingdom, Oct. 21, 1982, 8230093

Int. Cl.[4] D06F *75/02*

U.S. Cl. 38—86 **27 Claims**



1. A smoothing iron comprising a body structure, a handle associated with said body structure, a baseplate for application to material to be ironed, a gas burner for heating said baseplate, a tank incorporated in said body structure for storing liquefied fuel gas under pressure, said tank having an inlet for liquefied gas, a non-return inlet valve in said inlet for liquefied gas whereby a user may fill and replenish said tank thus producing a substantial accumulation of liquefied fuel gas therein, means defining a fuel flow path from the tank to the burner, and outlet valve in said fuel flow path having a closed position in which exit of fuel from the tank is prevented and an open position in which exit of fuel from the tank to flow to the burner is permitted, and a flow restrictor in said flow path, wherein said flow restrictor includes a deformable porous material arranged in said flow path, and means for compressing said porous material to a selectable degree to regulate fuel gas flow.

4,571,864

APPARATUS FOR TENSIONING RECTANGULAR PIECES OF FABRIC

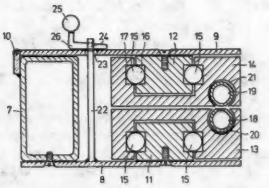
Peter Bopp, Unterengstringen, Switzerland, assignor to G. Bopp & Co. AG, Zurich, Switzerland

Filed Nov. 5, 1984, Ser. No. 668,021

Claims priority, application Switzerland, Nov. 4, 1983, 5959/83

Int. Cl.[4] D06C *3/08*

U.S. Cl. 38—102.5 **13 Claims**



1. An apparatus for tensioning pieces of fabric comprising a tensioning frame, said frame comprising at least two pairs of opposed stretcher bars displaceable relative to one another, the stretcher bars having two cooperating clamping means opposed to one another for clamping a piece of fabric, the clamping means having a rail carrying a plurality of runners slidable

thereon, the runners having a longitudinal groove receiving an expansible tube member extending the entire length of the stretcher bar and capable of radial and longitudinal expansion when pressurized, whereby the cooperating tubes clamp the fabric.

4,571,865

CONTAINER FOR A STACK OF PICTURES

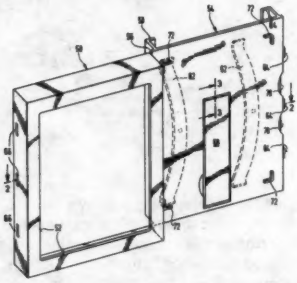
Peter Ackeret, Küsnacht, Switzerland, assignor to Licinvest AG, Chur, Switzerland

Filed Sep. 30, 1983, Ser. No. 537,530

Claims priority, application Fed. Rep. of Germany, Oct. 4, 1982, 3236644

Int. Cl.⁴ G09F *3/18*

U.S. Cl. 40—10 R **24 Claims**



1. A container for accommodating a stack comprising a variable number of pictures, said container comprising an engagement member and a housing member, one of said members having a display window, and one of said members being movable relative to the other between a closed relative position and an open relative position; and a biasing device for urging at least one picture of a stack of pictures against said display window; said engagement member including picture-support means for engaging at least one and at most three edges of a stack of pictures in said container, said picture-support means being arranged such that, when said members are in said open position, the stack is accessible for removal from the container in a direction toward an edge not engaged by said picture-support means, and said picture-support means being shaped to limit motion of a stack in either direction perpendicular to the planes of the image-bearing surface of each picture of the stack, when said members are in said open position.

4,571,866

ADJUSTABLY MOUNTABLE DISPLAY FRAME

Mark T. Cole, W. Groton, and Charles F. Sherman, Townsend, both of Mass., assignors to Nielsen Moulding Design Corp., Townsend, Mass.

Continuation of Ser. No. 499,362, May 31, 1983, abandoned. This application Aug. 9, 1984, Ser. No. 639,132

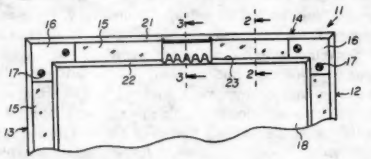
Int. Cl.⁴ A47G *1/06*; G09F *1/12*

U.S. Cl. 40—152.1 **10 Claims**

1. A frame apparatus for mounting a display item on a vertical support surface and comprising:

a frame assembly comprising elongated side members each having one end joined with a different end of an elongated top member and an opposite end joined with a different end of an elongated bottom member, said members forming a rectangular enclosure for retaining a peripheral edge of the display item, said top member comprising an elongated extrusion with a rearwardly opening retainer channel, and said channel comprising a pair of longitudinally extending parallel lips separated by a rearwardly opening slot; and

mounting means comprising a retainer portion retained by said channel and movable thereon along a path substantially parallel to said elongated top member and an attachment portion disposed externally of said channel and adapted to removably engage and be supported by an appendage fixed to the support surface; said retainer portion comprising a resilient latch portion engaging an inner surface of one of said lips and a projection portion means engaging an inner surface of the other of said lips, said latch portion and said projection portion being spaced



apart by a distance greater than the separation of said lips such that entry of said projection and latch portions into said channel requires temporary deformation of said resilient latch portion, and wherein said resilient latch portion comprises a resilient cam portion engaging said one lip and movable thereby to reduce said distance and permit removal of said retainer portion from said channel in response to an application of force on said attachment portion in a direction away from said top member.

4,571,867

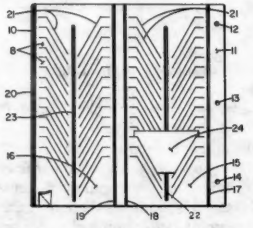
INFORMATION ORGANIZING DEVICE

Marvin E. Williams, Worthington, Ohio, assignor to The Huntington National Bank, Columbus, Ohio

Filed Dec. 7, 1983, Ser. No. 559,099

Int. Cl.⁴ B42F *5/00*

U.S. Cl. 40—405 **3 Claims**



1. An information organizing device comprising:

(a) at least one sheet of a flexible material restrained at its edges from inward movement;

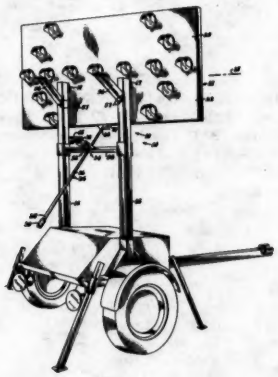
(b) at least two, side by side, spaced columns of downwardly converging slits, each column having a plurality of nearly parallel slits made in said sheet of said flexible material to form legs in said material between parallel slits; and

(c) a pinch crease fashioned into said sheet of said flexible material along a central axis between the columns of slits and spaced from the near terminal ends of the parallel slits, the pinch crease gathering the sheet material toward the central axis so as to impart a twist into the legs.

4,571,868
MOUNTING FOR SIGNBOARD

Richard F. Forestal, 2705 Duane Dr., Indianapolis, Ind. 46227

Filed Aug. 24, 1984, Ser. No. 643,774
Int. Cl.[4] G09F *21/04*
U.S. Cl. 40—590 13 Claims



1. Mounting means for a signboard for releasably retaining a signboard in a generally vertical sign-display position and in a generally horizontal travel or transport position, and for supporting the signboard in and between said positions, comprising, in combination:

laterally-spaced support means which are movably connected to the signboard along an axis which is such that the signboard portions which are above that axis and the signboard portions which are below that axis, when in the generally vertical position of the signboard, are substantially balanced when the signboard is in positions other than vertical,

a control rod means which as specified below provides both

(a), a manually controllable control handle, and

(b), a retaining latch member;

the control rod means being supportingly connected to the signboard at a location spaced from said axis, and extends therefrom to provide a manually operable handle remote from the signboard for moving the signboard about said axis into and between said positions,

the control rod means and associated support means provided with co-operating abutment means by which the control rod means is optionally retained at a location, with respect to the said associated support means, such that the control rod means releasably retains the signboard in a selected one of said positions;

in a combination in which

(c), the location of the control rod means' supporting connection to the signboard is a substantial distance from and generally below the axis of the laterallyspaced support means of the signboard, when the signboard is in its generally vertical sign-display position; and

(d), the travel of the control rod means in its movement for achieving both generally horizontal travel or transport position of the signboard and its generally vertical sign-display position, and in all positions of the control rod means therebetween, is always under the said axis of the laterally-spaced support means of the signboard; and

(e), the supporting connection of the control rod means to the signboard, in and between its locations in which it is when the signboard is in said generally horizontal travel or transport position and its generally vertical sign-display position, being generally in the quadrant which is:

(e.1) generally below the axis of the laterally-spaced support means of the signboard, and

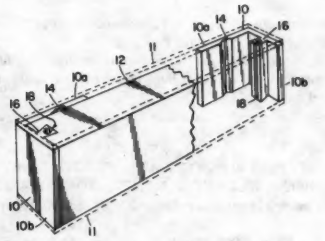
(e.2) generally behind said axis with respect to the side of the said signboard at which is the end of the control rod means which is the end thereof other than the end which is connected to the signboard, and

(f), the signboard, in moving from its generally vertical sign-display position to its generally horizontal travel or transport position, moves in a manner to move into downwardly-facing position the face of the signboard which in the signboard's generally vertical sign-display position is the face which faces the end of the control rod means which is the end thereof other than the end which is connected to the signboard.

4,571,869
SIGNBOARDS

Georges Huel, 65 Sherbrooke St. East, Montreal, Quebec, Canada (H2X 1C4)

Filed Mar. 14, 1984, Ser. No. 589,466
Claims priority, application Canada, Apr. 26, 1983, 426735
Int. Cl.[4] G09F *7/00*
U.S. Cl. 40—605 10 Claims



1. A signboard with easily replaceable indicia carrying faces comprising a first member including a back panel having opposite side edges and side walls extending substantially perpendicularly from said respective side edges, said side walls having a selected length and free ends, said first member having a selected length between said side walls,

a side member including a front panel having opposite side edges and side walls extending substantially perpendicularly from said side edges of said front panel,

said first and second members having mortise and tenon joints for interconnecting said first and second members, said joints being spaced from said front and back panels of said members when said members are interconnected, said signboard including retaining means for detachably connecting said side walls to prevent relative movement.

4,571,870
QUICK RELEASE MOUNT FOR FIREARM AIMING DEVICE

Robert J. Heideman, Westland; Jerry B. Holden, Livonia, and Richard W. Crain, Canton, all of Mich., assignors to Hydra Systems International, Inc., Bridgeport, Conn.

Filed Oct. 24, 1983, Ser. No. 544,541
The portion of the term of this patent subsequent to Sep. 10, 2002, has been disclaimed.
Int. Cl.[4] F41G *1/34*
U.S. Cl. 42—1 A 28 Claims

1. Apparatus for removably mounting an aiming laser on the barrel of a rifle or the like, comprising:

an elongate base member adapted to extend essentially parallel to the longitudinal axis of the barrel in a position beneath the barrel;

a forward mount including a ring adapted to be slideably received over the barrel, a slide member having said ring

secured thereto and means for slideably mounting said slide member on said base for sliding movement between a locked position securing said ring on the barrel and a released position allowing disengagement of said ring from the barrel;

means carried by said slide member for adjusting the elevation of one end of the laser relative to said longitudinal axis;

a rear mount adapted to releaseably connect the barrel with a rear portion of said base; and

means connected with said rear mount for adjusting the horizontal alignment between said base and said longitudinal axis.

4,571,871

U-SHAPED SUPPORT AND PIVOTAL LEVER FOR FIXING A BARREL TO THE BODY OF A FIREARM

Juli Timari, Hatanpäänvaltatie 32, SF-33100 Tampere 10, Finland

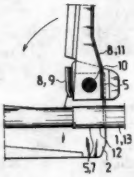
PCT No. PCT/FI83/00018, § 371 Date Oct. 24, 1983, § 102(e) Date Oct. 24, 1983, PCT Pub. No. WO83/02999, PCT Pub. Date Sep. 1, 1983

PCT Filed Feb. 25, 1983, Ser. No. 551,999

Claims priority, application Finland, Feb. 26, 1982, 820714

Int. Cl.[4] F41C *21/22*

U.S. Cl. 42—75 A **7 Claims**



1. In a firearm having a body and an elongated barrel, the improvement comprising fixing means for releasably securing the barrel to the body of the firearm, said fixing means comprising:

axle pin means mounted to the body transverse to the elongation of the barrel;

a substantially U-shaped barrel supporting member comprising a pair of legs and a bridge connecting said legs, the legs of said supporting member being mounted to the firearm body at said axle pin means for receiving and supporting the barrel on said bridge;

an eccentric locking member pivotally secured to the firearm body at said axle pin means for pivotal movement relative to said body and to said supporting member between a first position remote from said supporting member and in which the barrel is freely movable into and out of operative position with respect to the body, and a second position nested within said supporting member for firmly pressing the barrel between the locking member and said supporting member bridge to thereby releasably secure the barrel to the firearm body.

4,571,872

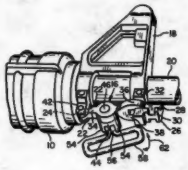
DEVICE FOR ATTACHING A FRONT SLING-RECEIVING LOOP TO A WEAPON

David A. Johnson, 3432 Tanglewood Way, Salem, Oreg. 97302

Filed Sep. 6, 1984, Ser. No. 648,451

Int. Cl.[4] F41C *23/02*

U.S. Cl. 42—85 **17 Claims**



1. A device for attaching a sling to a shoulder weapon having a front mount for a sling loop including a pair of laterally apart-spaced ears, each defining one of a pair of transverse holes colinearly aligned with each other, and having a lug placed longitudinally a predetermined distance apart from said mount, said lug including a vertical central web and a pair of wider portions located respectively above and below said central web, said device for attaching a sling comprising:

(a) an elongate body having a pair of opposite ends and a pair of opposite sides;

(b) a fork located at a first of said opposite ends, said fork including a pair of arms separated laterally from one another a distance great enough to receive said central web therebetween;

(c) the other of said opposite ends including means for defining a transverse bore extending therethrough and having a width no greater than the distance between said apart-spaced ears, said body having a length corresponding to said predetermined distance so that said transverse bore can be aligned between said transverse holes when said central web is located between said arms of said fork; and

(d) means connected with said body for attaching a sling loop to said body intermediate said opposite ends thereof.

4,571,873

BLACK POWDER MEASURING DEVICE THE PRO-CHARGER

Stanley M. Houk, 3014 Chancery Ct., Rapid City, S. Dak. 57702

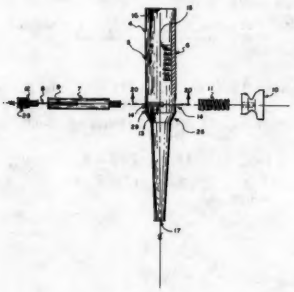
Filed Apr. 21, 1983, Ser. No. 487,042

Int. Cl.[4] F41C *27/00*

U.S. Cl. 42—90 **9 Claims**

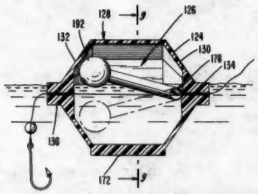
1. A muzzle loading, measuring, transporting, and dispensing device for use with muzzle loading firearms, such as rifles, pistols, and shotguns, comprising: an elongated cylinderical open-ended body for receiving from ten to one hundred ninty grains of powder; a transparent scale viewer in said cylinderical body for measuring and viewing powder contained therein

without distortion; a plunger rod having a carriage member thereon to capture and release the powder contained within



the cylinderical body; and said plunger rod having an opening at one end thereof for receiving and holding a nipple pick.

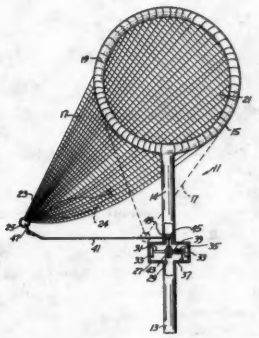
4,571,874
CASTING BOBBER WITH PREDETERMINED DEPTH SETTING
Jesse Smaw, 10 Manor Rd., Paterson, N.J. 07514
Filed Nov. 7, 1983, Ser. No. 549,550
Int. Cl.[4] A01K *93/00*
U.S. Cl. 43—4.5 **21 Claims**



1. A fishing bobber system comprising:
a fishing bobber including a housing having a hollow interior defining a chamber within said housing, said housing having a top end and a bottom end;
passageway means for receiving a fishing line, said passageway means being adapted to releasably secure said housing on said fishing line with said housing being freely slidable along said fishing line, said passageway means including a continuous, resiliently closable opening formed in said housing, said resilient opening extending along said housing from said top end to said bottom end whereby said fishing line may be urged into said housing at an intermediate section of the fishing line; and floatation means within said chamber as the primary source of buoyancy for said fishing bobber.

11. A fishing bobber comprising:
a housing having a hollow interior defining a chamber within said housing, said housing having a top end and a bottom end;
passageway means for receiving a fishing line, said passageway means being adapted to releasably secure said housing on said fishing line with said housing being freely slidable along said fishing line, said passageway means including a continuous opening extending along said housing from said top end to said bottom end whereby said fishing line may be urged into said housing at an intermediate section of the fishing line; and
flotation means for rendering said fishing bobber buoyant, said flotation means including a pair of floats mounted on a common shaft for rotation about an axis of the shaft, said floats and said shaft being mounted within said chamber of said housing, said axis of said shaft being perpendicular to said axis passing through said top end and said bottom end of said housing, one of said floats being provided on either side of a notch in said shaft, said notch being adapted to frictionally engage said fishing line upon rotation of said shaft to releasably fix said housing with respect to said fishing line.

4,571,875
FISH LANDING NET
William E. Ballas, 8037 Winona, Allen Park, Mich. 48101
Filed Mar. 8, 1985, Ser. No. 709,673
Int. Cl.[4] A01K *77/00*
U.S. Cl. 43—11 **7 Claims**



1. A fish landing net comprising of elongated tubular handle;
a circular net support frame on one side secured to one end of said handle and coplanar therewith;
a netting of conical form having an apex and a circular open end receiving and mounted over said frame and secured thereto;
a ring secured to said apex;
a tension spring biased pulley journaled and supported within said handle intermediate its ends;
and a flexible cord wound around and at one end secured to said pulley, extending through an aperture in said handle and at its free end secured to said ring;
said cord being normally wound upon said pulley with the netting apex closely adjacent said handle collapsing said netting when not in use, projecting of a fish into said netting, expanding said netting to a position substantially at right angles to said handle and unwinding said cord against said spring tension;
said cord automatically rewinding, collapsing said netting when the fish is removed therefrom.

4,571,876
ICE FISHING DEVICE
Louis LeClair, 124 Ash Swamp Rd., W. Scarborough, Me. 04074
Filed Aug. 10, 1984, Ser. No. 639,503
Int. Cl.[4] A01K *97/12*
U.S. Cl. 43—17 **5 Claims**

1. Ice fishing rig for fishing through a hole in the ice comprising
a mounting ring of suitable diameter
at least three legs hinged to said ring so as to be movable between a folded position adjacent the plane of the ring

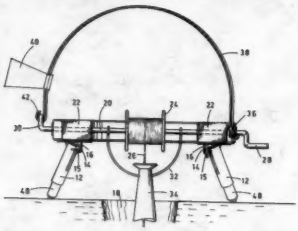
for storage and transportation to a spread downwardly depending position for supporting the rig on the surface of the ice straddling said hole

a windlass unit mounted on said ring with its horizontal shaft extending across its diameter and revolving in bushings thereon

said shaft adapted to receive and support a fishing line reel for revolving therewith

a springy flag-staff held by one end on one side of said ring

means on one end of said shaft for releasably retaining the free end of said staff on the other side of said ring when it



is flexed across said ring and adapted to release the same when said shaft is revolved

said means for releasably retaining the free end of said staff comprises a first and second bend formed in the end of said shaft said first bend holding said free end of said staff for quick release, said second bend holding said free end of said staff for more delayed release

whereby, after the fishing line is set, said springy staff may be releasably held in its flexed position subject to release and springing upright when a fish takes the line and thereby revolves said shaft.

4,571,877

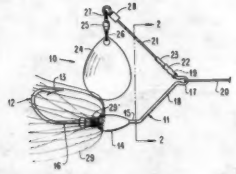
FISHING LURE

Keneith R. Montgomery, 220 W. Daisy La., New Albany, Ind. 47150

Filed Sep. 17, 1984, Ser. No. 651,311

Int. Cl.[4] A01K *85/00*

U.S. Cl. 43—42.11 **13 Claims**



1. A fishing lure including:

a substantially rigid arm having a hook adjacent one end thereof and weight means adjacent said hook;

said substantially rigid arm having attachment means for attachment to a fishing line adjacent its other end;

at least one substantially straight non-rigid arm separate from said rigid arm;

connecting means to connect one end of said non-rigid arm to said substantially rigid arm adjacent the other end of said substantially rigid arm and beyond said attachment means;

said non-rigid arm having spinner means rotatably connected thereto for rotation relative to said non-rigid arm, said spinner means being rotatably connected to said non-rigid arm remote from the connection of said non-rigid arm to said substantially rigid arm;

and said non-rigid arm being flexibly movable relative to said substantially rigid arm when said lure is subjected to a torque.

4,571,878

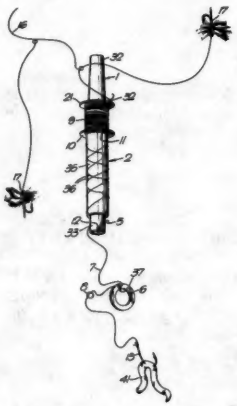
FISHING TACKLE INCLUDING LINE RELEASING FLOAT

Sigurd P. Nyman, P1 3310, Loffstrand, S-680 50 Ekshärad, Sweden

Filed Dec. 13, 1983, Ser. No. 560,875

Int. Cl.[4] A01K *93/00*

U.S. Cl. 43—43.11 **9 Claims**



9. Fishing tackle including a casting float comprising a bobber and a second member comprising a line drum for a sinking line, said second member made of a non-buoyant material but kept afloat by the buoyant bobber immediately below the water surface; the fishing tackle further comprising locking means for securing the sinking line to said line drum during at least the initial part of a cast but releasing the sinkin line prior to the float hitting the water surface.

4,571,879

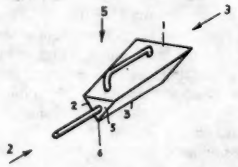
SINKER FOR A FISHING LINE

George A. Peroff, 16 Regent St., Port Macquarie, 2444, New South Wales, Australia

Filed Jul. 18, 1984, Ser. No. 633,031

Int. Cl.[4] A01K *95/00*

U.S. Cl. 43—44.97 **6 Claims**



1. A sinker which has an elongated pentahedral body which tapers uniformly in the length direction with an isosceles triangular bottom which is larger than a similar isosceles triangular top, the bottom and top are in parallel planes at right angles to the apex edge of the body which is the edge joining the apex of the triangles forming the bottom and top of the body, a rail

parallel to the apex edge of the body and located longitudinally centrally above the base surface of the body which is the surface having the bases of the triangles forming the bottom and top of the body as its ends, and an arm extending from the top of the body in a direction parallel to the rail.

4,571,880

ACCESS STRUCTURE FOR USE IN TRAPPING FLYING INSECTS, AND FLY TRAP INCLUDING SUCH STRUCTURE

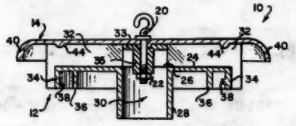
John J. P. Hayward, 37 Union Ave., Union Park, Stellenbosch, South Africa

Continuation-in-part of Ser. No. 416,321, Sep. 9, 1982, abandoned. This application May 24, 1984, Ser. No. 613,784

Claims priority, application South Africa, Sep. 16, 1981, 81/6440

Int. Cl.⁴ A01M 1/10

U.S. Cl. 43—122 **10 Claims**



1. An access structure for use in trapping flying insects, the device comprising:

a lid member having a horizontal top portion in which there is an access opening for the passage therethrough of flying insects;

a cover member spaced upwardly from the top portion, and being arranged to form a roof over the access opening; and

at least two upright vanes disposed in the space between the top portion and the cover member, the vanes converging to the access opening.

4,571,881

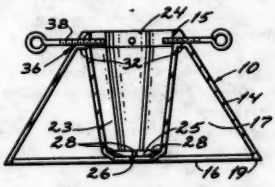
CHRISTMAS TREE STAND

Delbert L. Lathim, Kennewick, Wash., assignor to Lathim Industries, Inc., Kennewick, Wash.

Filed Aug. 5, 1983, Ser. No. 520,846

Int. Cl.⁴ A47G 7/02

U.S. Cl. 47—40.5 **9 Claims**



1. A Christmas tree stand formed as a unitary body of synthetic resin by injection molding, comprising:

a hollow conical frustum shell having an inner surface and an outer surface extending between a circular top end and an enlarged circular bottom end formed about an upright center axis;

the bottom end of the shell having a flat annular support edge surface;

a tree trunk receptacle formed integrally and coaxially within the shell, having a wall thickness dimension between an outer surface and an inner surface extending from an open top end and leading to a closed bottom end axially adjacent the bottom edge of the shell;

an annular edge having a thickness dimension between an upper and a lower surface and joining the top edges of the receptacle and conical shell;

wherein the receptacle top edge and shell are unitary and are formed integrally of a synthetic resin;

fillet means internally interconnecting with the shell, top edge and receptacle, radially joining the conical shell and receptacle along the lower surface of the top edge, and spaced about the central axis of the shell for strengthening the shell and receptacle adjacent the top ends thereof by incorporating the thickness dimensions of the receptacle, top edge, and shell integrally with the fillet means as a single structural unit;

radial bores of prescribed diameters extending from open ends flush with the smooth outer shell surface and extending through the shell, fillets, and receptacle to inner openings flush with inner smooth surface of the receptacle; and

a metal screw for each bore, having a threaded shank with a prescribed major thread diameter greater than the corresponding prescribed bore diameter, turned axially into the bore such that the threaded shank taps the bore, forming female threads therein.

4,571,882

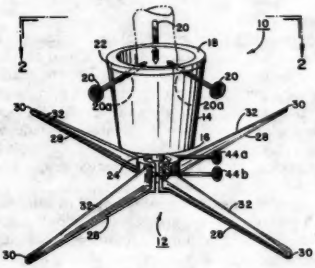
STAND FOR TREES, STANDARDS AND THE LIKE

John M. Capen, 1321 Sanford Ave., Vermilion, Ohio 44089

Filed Oct. 27, 1983, Ser. No. 545,886

Int. Cl.⁴ A47G 7/02

U.S. Cl. 47—40.5 **3 Claims**



1. An improved support stand comprising:

a first support member including a pair of support legs terminating in a concave wall member, wherein interior walls of said wall member defines a hemispheric cavity, said wall member also including a pair of shoulder members each having a threaded aperture therethrough,

a second support member including a pair of support legs terminating in a concave wall member, wherein interior walls of said wall member defines a hemispheric cavity, said wall members also including a pair of shoulder members having one aperture and one elongated aperture therethrough, said threaded aperture and said elongated aperture being in radial alignment with said threaded aperture of said first support member, said first and second support members maintained in a fixed relationship to each other by fastening means engaged by said threaded apertures,

receptacle means closed at one end and open at the other end and provided with a circumferential shoulder at said open end, said shoulder provided with a plurality of threaded apertures, and further provided with a plurality of threaded bolt means for each threaded aperture, said bolt means engaging an elongated foreign member placed in said receptacle means, and

said elongated aperture on said second support member permitting the adjustment of said support legs for various positions of inclination thereby allowing the use of said support stand on uneven surfaces.

4,571,883

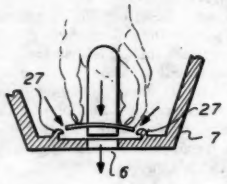
PLANT POT DRAIN

Roy Shaw, 34 Elizabeth St., Caldwell, N.J. 07006

Continuation-in-part of Ser. No. 525,330, Aug. 22, 1983, which is a continuation-in-part of Ser. No. 410,341, Aug. 23, 1982, abandoned. This application Jun. 26, 1984, Ser. No. 624,798

Int. Cl.[4] A01G *9/02*

U.S. Cl. 47—66 **6 Claims**



1. In combination with a plant pot having a base containing a vertical hole extending from the interior surface of the base to the exterior surface of the base, said hole permitting the flow of water out of the plant pot, a potting medium within the pot and a detachable plant pot drain unit comprising:

a. a cylindrical main body having a hollow interior chamber to allow passage of water, said body extending from the exterior surface of the base through said vertical hole into the pot,

b. a horizontally extending radial disc affixed to the outer surface of said main body adapted to rest on the interior surface of the base to support the plant pot drain unit and to hold the cylindrical main body in an upright position in said vertical hole, with ridges disposed at the bottom side of the disk for providing channels to guide water for flowing off between the edge of the hole and the outside of the bottom part of the main body extending below the disk,

c. the cylindrical main body extending above the disc having a multiplicity of small apertures to allow water to pass from the potting medium within the plant pot through said hollow interior chamber and out of said drain hole, said apertures being small enough to prevent the passage of potting medium from the pot and a solid top portion, the weight of the potting medium pressing against said top portion and said disc to hold the pot drain unit in place in the vertical hole.

4,571,884

ARRANGEMENT FOR LOWERING AND LIFTING OF A WINDOW OF A MOTOR VEHICLE DOOR

Richard Hetmann, Tamm, and Hermann Ziegler, Renningen, both of Fed. Rep. of Germany, assignors to Dr. Ing. h.c.F. Porsche A.G., Fed. Rep. of Germany

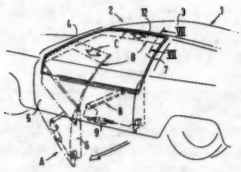
Filed Jan. 6, 1984, Ser. No. 568,639

Claims priority, application Fed. Rep. of Germany, Jan. 14, 1983, 3301071

Int. Cl.[4] B60J *1/08;* **E05F** *15/00*

U.S. Cl. 49—72 **15 Claims**

1. An installation for lowering and lifting a window of a motor vehicle door, comprising window lifter means including a driving motor and an operating switch for controlling the driving motor, and additional control means for controlling the driving motor in such a manner that the window is automatically displaced into a lowered position during the opening of the door and is raised again into an upper end position after completion of the door closing operation, said control means including at least one switching means which becomes effective during opening and closing of the door, said switching means being operatively connected with timing circuit means responsive to a voltage change, and power switching means,



the timing circuit means applying a pulse signal to the power switching means operable to set the driving motor into operation for a defined length of time and in a defined direction of rotation.

4,571,885

REVERSIBLE WINDOW WITH A MOVABLE ROTARY SHAFT

Noboru Uemura, Tokyo; Hiroaki Sahara, Chiba, and Yasunori Hirayama, Saitama, all of Japan, assignors to Sumitomo Wall Systems, Ltd., Tokyo, Japan

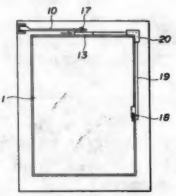
PCT No. PCT/JP83/00131, § 371 Date Aug. 30, 1983, § 102(e) Date Aug. 30, 1983, PCT Pub. No. WO83/04278, PCT Pub. Date Dec. 8, 1983

PCT Filed Apr. 28, 1983, Ser. No. 608,697

Claims priority, application Japan, Jun. 4, 1982, 57-94975

Int. Cl.[4] E05D *15/22*

U.S. Cl. 49—177 **3 Claims**



1. A window frame construction having an outer window frame having a window opening therein of a first defined width and an inner window frame of a second defined width to be received in said window opening and of a defined thickness, and reversible support means for supporting said inner window frame for swinging movement on said outer window frame and in said window opening between first and second positions which are 180° reversed from one another, said reversible support means comprising:

at least one arm and first hinge means for hingedly securing one end of said arm to said outer window frame and second hinge means for hingedly securing the other end of said arm to said inner window frame, said second hinge means defining a reverse rotation shaft for permitting said inner window frame to move between said first and second positions thereabout, control mean for controlling the relative positions between said inner and outer window frames so that a first plane of said inner window frame is oriented perpendicular to a second plane of said outer window frame when said inner window frame is located along one edge of said window opening in said outer window frame thereby making the available width of said window opening said first defined width less said defined thickness, said control means including slide means on at least one of said outer window frame and said inner win-

dow frame for movably supporting the associated one of said first and second hinge means for movement relative to said outer and inner window frames so that said inner window frame will be able to move from said position wherein said first plane thereof is perpendicular to said second plane to a 180° reversed position wherein said first and second planes are parallel.

4,571,886

CONSTRUCTION OF DOOR IN MOTOR VEHICLE

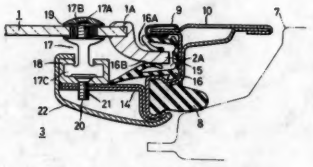
Daiichi Shiraishi, Seto, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Japan

Filed Jul. 18, 1984, Ser. No. 631,883

Claims priority, application Japan, Jul. 18, 1983, 58-111331[U]; Jul. 18, 1983, 58-111332[U]

Int. Cl.⁴ E05F *11/38*

U.S. Cl. 49—374 **16 Claims**



1. A window assembly for a motor vehicle door, comprising:

a window pane;

a window piece secured to an end of said window pane, having a slide portion at a forward end offset toward the interior of the vehicle and being substantially crank shaped in crosssection;

a seal member disposed on the side of a door frame and in contact with said slide portion on opposite sides thereof in a direction lateral to said window pane such that the slide portion is slidable in the direction of opening or closing of said window pane, forming a seal between said door frame and said window piece;

a sliding piece projected toward said interior of the vehicle and secured to said window pane at a position closer to the center of said window pane than said window piece; and

a guide formed on said door frame for guiding said sliding piece in the direction of opening or closing said window pane and regulating the position of said window pane at least in the direction of the width of said window pane through said sliding piece, said window piece having an extension formed along the interior surface of said window pane toward the center of said window pane and connected to said sliding piece.

4,571,887

AUTOMATIC FRICTION SASH HOLDER

Garry P. Haltof, Rochester, N.Y., assignor to Caldwell Manufacturing Company, Rochester, N.Y.

Filed Mar. 26, 1984, Ser. No. 593,397

Int. Cl.⁴ E05F *3/00*

U.S. Cl. 49—429 **39 Claims**

1. A sash holder for automatically varying the vertical sliding friction of a sash running in a sash run having a vertical guide wall extending from said sash run into a plow region of a stile of a sash, said holder comprising:

a. an upper component having a balance spring connection;

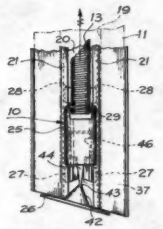
b. a lower component having a platform for said sash;

c. said components having runners disposed for frictionally sliding along said guide wall as said sash slides vertically in said sash run;

d. said components having overlapping surfaces shaped to form an interferring wedge;

e. said overlapping surfaces of said interferring wedge being arranged to move vertically relative to each other in response to force of a spring pulling upward on said spring connection against the weight of said sash resting on said platform; and

f. said vertical movement of said overlapping surfaces of said



interferring wedge causing lateral movement of said runners against said guide wall to vary the pressure of said runners against said guide wall and thereby vary said vertical sash sliding friction automatically as a function of the extent of said vertical movement of said overlapping surfaces.

4,571,888

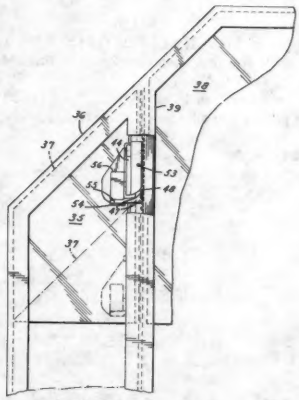
VENT WINDOW LATCH

Kirk S. Jensen, Allen Park, Mich., assignor to Irvin Industries Inc., Rochester Hills, Mich.

Filed Jun. 11, 1984, Ser. No. 619,485

Int. Cl.⁴ E05C *17/62*

U.S. Cl. 49—450 **10 Claims**

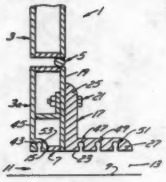


1. Manually operable vent window for automotive vehicle comprising, window frame means including vertical guide tracks and top edge seal, vent window glass slidable in said vertical guide tracks, fixed ratchet rack means extending along one of said vertical guide tracks, bracket means secured to said vent window glass for imparting vertical adjustment, manual means for moving said bracket means including vertically resilient lost motion connection means, and latch means connected to said manual means for engaging said ratchet means in any adjusted position of said vent window glass, whereby said manual means may raise said vent glass to its uppermost position engaging said top edge seal and impart an upward resilient bias to retain said vent glass in said top edge seal engaging position upon latch engagement with said ratchet means.

4,571,889
ROLLING CLOSURE BOTTOM SEAL

H. M. Robert Labelle, Cornwall, Canada, assignor to Martinray Industries Ltd., Cornwall, Canada

Filed Jan. 25, 1984, Ser. No. 573,673
Claims priority, application Canada, May 19, 1983, 428518
Int. Cl.[4] E06B 7/15
U.S. Cl. 49—482 6 Claims

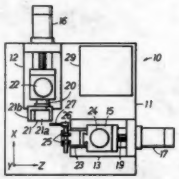


1. A closure; a flexible sealing strip for the closure having first mounting means on one side of the strip, and second mounting means, parallel to the first mounting means on the other side of the strip; a first sealing strip mounting means in a first location on the bottom of the closure; a sealing strip mounting member fixed to the bottom of the closure in a second location spaced from the first location, the distance between the first and second locations varying depending on the thickness of the closure; and at least two other spaced-apart sealing strip mounting means on the bottom of the mounting member, whereby the first mounting means of the sealing strip can be mounted in the first sealing strip mounting means on the closure and the second mounting means on the sealing strip can be mounted in one of the other sealing strip mounting means in the sealing strip mounting member, the one of the other sealing strip mounting means selected dependent on the thickness of the closure.

4,571,890
TRACK SLIDER GRINDER

Akira Dosaka, Koganei, Japan, assignor to Ikari Machine Tools Co., Ltd., Tokyo, Japan

Filed Jan. 17, 1985, Ser. No. 692,438
Claims priority, application Japan, Oct. 2, 1984, 59-207640
Int. Cl.[4] B24B 9/00
U.S. Cl. 51—92 ND 3 Claims



1. A device for grinding a track slider of ferrite having a tracing surface and an integral C-shaped core positioned on one side of the tracing surface and including a coil support portion in the form of a quadrangular prism having a central axis, said device comprising:

(a) a holder for supporting the track slider for rotation about the central axis of the coil support portion;

(b) a rotational drive source for angularly displacing said holder through a prescribed angle;

(c) a grinding tool for grinding an edge of the coil support portion of the core into a duller surface;

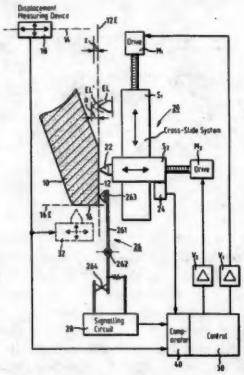
(d) a three-dimensional guide drive mechanism for relatively moving said grinding tool and said holder in X-, Y-, and Z-axis directions; and

(e) a numerical control unit for controlling said three-dimensional guide drive mechanism to position the track slider and said grinding tool relatively to each other and for enabling said grinding tool to grind the edge of the coil support portion of the core while relatively moving said grinding tool and the core in the direction of the central axis of the core.

4,571,891
APPARATUS FOR COMPENSATING FOR DRESSING TOOL WEAR DURING THE DRESSING OF GRINDING WHEELS

Meinrad Donner, Nuolen, Switzerland, assignor to Maag Gear-Wheel and Machine Company Limited, Zurich, Switzerland

Division of Ser. No. 472,652, Mar. 7, 1983, Pat. No. 4,539,779.
This application Mar. 18, 1985, Ser. No. 713,011
Claims priority, application Switzerland, Mar. 19, 1982, 1706/82
Int. Cl.[4] B24B 49/18
U.S. Cl. 51—165.87 2 Claims



1. A dressing apparatus containing a dressing tool for dressing a grinding wheel, said apparatus comprising:

an adjustable grinding wheel having a working face;

said grinding wheel being adjustable so that said working face thereof is located in a predetermined plane;

a displacement measuring system operatively coupled to said grinding wheel;

a sensing device for determining the presence of said working face of said grinding wheel in said predetermined plane;

a dressing tool for dressing said working face of said grinding wheel by a desired dressing amount;

a cross-slide system comprising a first slide and a second slide for displaceably supporting said dressing tool;

drive means for adjusting each one of said first slide and said second slide;

said first slide and said second slide each being respectively infinitely displaceable essentially in parallel and normally with respect to said working face of said grinding wheel;

control means operative in response to said sensing device and operatively coupled to said displacement measuring system in response to displacement data supplied thereto by said displacement measuring system; and

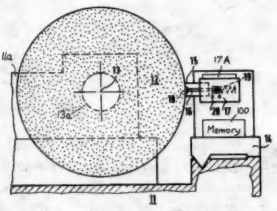
said control means serving to evaluate said displacement data and determining a difference between said displacement data indicative of the amount of displacement of the grinding wheel so as to position said working face thereof in said predetermined plane following a dressing operation and said desired dressing amount and controlling the drive means for adjustment of said second slide in response to said difference.

4,571,892

METHOD OF DRESSING GRINDING WHEELS IN GRINDING MACHINES

Jürgen Brill, Stuttgart, Fed. Rep. of Germany, assignor to Schaudt Maschinenbau GmbH, Stuttgart, Fed. Rep. of Germany

Filed Apr. 24, 1984, Ser. No. 603,460
Claims priority, application Fed. Rep. of Germany, Apr. 27, 1983, 3315197
Int. Cl.[4] B24B *49/18*
U.S. Cl. 51—325 12 Claims



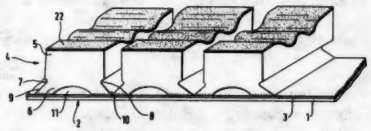
1. A method of repeatedly dressing the grinding wheel in a grinding machine wherein the grinding wheel is movable at right angles to its axis of rotation toward and away from a dressing tool and a mobile sensor, wherein the dressing tool and the sensor are movable jointly in parallelism with the axis of the grinding wheel, and wherein the sensor is an element of a commercially available sensor type distance measuring instrument mounted on a carriage which also supports the dressing tool and is movable back and forth in parallelism with the axis of th grinding wheel, comprising the steps of locating the grinding wheel at a predetermined distance from the dressing tool upon completion of each dressing operation; placing the mobile sensor into contact with the grinding wheel while the latter is located at said predetermined distance from the dressing tool; memorizing the position of the sensor; and utilizing the memorized position of the sensor as a reference value for the position of the grinding wheel relative to the dressing tool preparatory to the next-following dressing operation.

4,571,893

ROTARY GRINDING TOOL

Gerd Brausch, Sassenberg 31, 4475 Sogel, Fed. Rep. of Germany

Filed Mar. 23, 1984, Ser. No. 593,421
Claims priority, application Fed. Rep. of Germany, Mar. 23, 1983, 3310514
Int. Cl.[4] B24D *11/00*
U.S. Cl. 51—397 6 Claims



1. A rotary grinding tool, particularly an endless grinding belt for a belt grinder machine for grinding wood profiles, said grinding tool comprising:

a rotary carrier element in the form of a soft, thin, non-extensible flat belt having a working side thereon; and

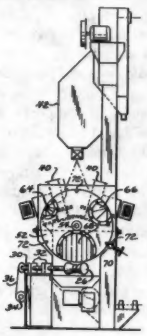
a layer formed of rubber on said working side of said flat belt, the thickness of said layer being a multiple of the thickness of said carrier element, said layer having a contour on the side facing away from said carrier element corresponding to the profile to be ground and which is coated with abrasive, said layer of rubber being divided into sections in the form of separated blocks evenly disposed along the length of said flat belt, each block comprising an elastic and deformable foot area cemented to the working side of said flat belt and a hard head block arranged thereabove having said contour therein.

4,571,894

MECHANISM FOR INDEXING WORK SEAL PLATES

F. Barton Bullis, South Bend, and John T. Pokorski, Osceola, both of Ind., assignors to Wheelabrator-Frye, Inc., Mishawaka, Ind.

Filed Oct. 18, 1984, Ser. No. 662,496
Int. Cl.[4] B24C *9/00*
U.S. Cl. 51—426 5 Claims



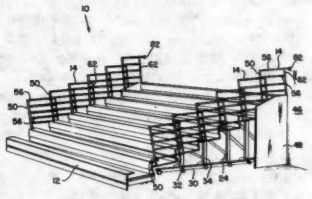
1. In a device for the surface treatment of work pieces of differing dimensions, the treatment device having a treatment chamber, means for treating work pieces while in the treatment chamber, said treating means comprising means for bringing abrasive or other surface treatment material into contact with the work pieces, openings in the treatment chamber through which work pieces may pass, means for conveying work pieces into and from the chamber through said openings; the improvement comprising at least one selective apparatus, each of the selective apparatus for sealing one of the treatment chamber openings against loss of treatment material therethrough, said selective apparatus comprising seal carrier means, at least two seal members on the carrier means adapted to admit passage of workpieces of predetermined dimensions and to seal said chamber opening, means for movably retaining the seal carrier means adjacent said chamber opening whereby each of the seal members may be selectively positioned in operative sealing relationship to the chamber opening.

4,571,895

TELESCOPING SEATING ASSEMBLY

Hugh M. Lyman, Jr., 25643 SE. 394th, Enumclaw, Wash. 98022

Filed Feb. 8, 1984, Ser. No. 578,028
Int. Cl.[4] E04H *3/16*
U.S. Cl. 52—9 38 Claims



1. A telescoping seating system comprising:

a plurality of rows movable between a forward extended use position in which said rows are in stepped relation and a rearward retracted storage position in which said rows are in superposed relation, one above another in a vertical column; and

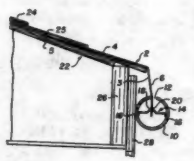
a guard structure positioned along at least one end portion of said rows being extendable and retractable therewith, said guard structure including a plurality of forwardly inclined, laterally upright posts each fixedly attached to one of said rows, a plurality of vertically spaced, substantially horizontal rails fixedly attached to each of said posts and extending rearwardly therefrom, said rails being spaced substantially equidistant from each other, said rails of at least one forward post extending rearwardly beyond a next rearward post when said rows are in said extended position, and each having a forward end portion fixedly attached to said forward post and a rearward end portion interconnected in fixed relation to each other by a spacer, said rails of said forward post being vertically offset from said rails of said next rearward post by substantially one or more vertical rail spaces to place pairs of said rails, including one rail from said forward post and one rail from said rearward post, in substantial juxtaposition, one above the other, said juxtaposed pairs of rails being longitudinally movable relative to each other, said posts being forwardly inclined sufficiently to permit nesting of one post forward of and against another post and said vertical space between said rails being sufficient to permit interleaving of said plurality of rails of said forward post between said plurality of rails of said next rearward post in parallel, noninterfering relation when said rows are moved from said extended position to said retracted position.

4,571,896

GUTTER ASSEMBLY

Southam B. Condie, 4705 Gair Ave., Terrace, British Columbia, Canada (V8G 2J8)

Filed Apr. 25, 1984, Ser. No. 603,716
Claims priority, application Canada, May 2, 1983, 427235
Int. Cl.[4] E04D *13/04*
U.S. Cl. 52—12 **10 Claims**



1. A gutter assembly comprising:

(a) an elongated sheet to be installed along an edge of a roof of a building with a part of said sheet extending below the roof edge, said part having an inner surface adjacent the building and an outer surface;

(b) a pipe having a longitudinal slot therein to receive said part of said sheet that extends below the roof edge while leaving room for entry of only water through the slot and into said pipe; and

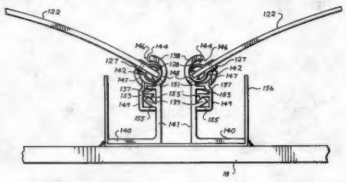
(c) a plurality of clips extending, from a surface of said part of said sheet to abut the interior of said pipe to retain the inner surface of said part of said sheet against an edge of the slot.

4,571,897

APPARATUS FOR MOUNTING SHEET MATERIAL AND MOUNTING ASSEMBLY AND STRUCTURAL SURFACE FORMED THEREWITH

Fred Kerr, P.O. Box 764, Huntersville, N.C. 28078

Filed Jul. 21, 1983, Ser. No. 515,808
Int. Cl.[4] E04B *1/00*
U.S. Cl. 52—13 **33 Claims**



1. Apparatus for mounting an edge of a continuous sheet of thermo-expansive and contractive material to a supporting surface comprising means adapted for affixation at said edge of said sheet for forming a thickness enlargement thereat, and mounting means adapted for affixation to said supporting surface and having channel means for receiving and retaining therein said enlargement, said channel means defining an enlarged interior receiving area profiled compatibly with and sufficiently larger than said enlargement to leave space in said receiving area unoccupied by said enlargement for permitting relatively free shifting movement of said enlargement within said receiving area in response to thermal expansion and contraction of said sheet and said channel means further defining a restricted outward opening smaller than said enlargement to retain said enlargement in said receiving area but sufficiently larger than the thickness of the adjacent unenlarged portion of said sheet for extension of said sheet outwardly through said restricted opening and to leave space in said restricted opening unoccupied by said adjacent unenlarged portion of said sheet for permitting relatively free shifting movement of said adjacent portion of said sheet within said restricted opening in response to thermal expansion and contraction of said sheet.

4,571,898

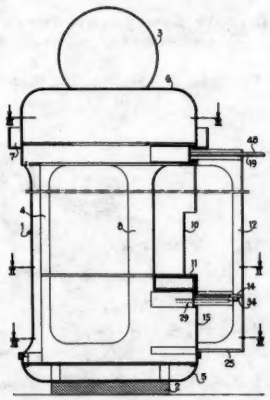
SALES BOUTIQUE, ESPECIALLY A NEWSPAPER KIOSK

Paul Le Cacheux; Andre Schuch, and Alain C. Perrot, all of Paris, France, assignors to Ville de Paris, Paris, France

Filed Dec. 7, 1982, Ser. No. 447,637
Claims priority, application France, Dec. 8, 1981, 81 22944
Int. Cl.[4] A47B *5/00*
U.S. Cl. 52—36 **23 Claims**

1. A sales boutique, especially a newspaper kiosk for exhibiting and selling newspapers and similar publications, of the kind installed on the public highway and consisting of a cell (1) disposed on a plinth (2) and having a door (9), vertical elongate windows (8), and articulated members (12), characterized in that the cell (1) is comprised of articulated members (12) which constitute a part or an entirety of a facade of said cell (1) and which can be brought from a closed position, over said windows (8), whereby said articulated members (12) define a unified external surface integrated with the external surface of the rest of the body (4) of the cell (1), to an open position, whereby said articulated members (12) define and protect a display space, and vice versa, said articulated members having horizontal shelves (24, 25) located on their lower, inner sides, said shelves (24, 25) having the general shape of circular sec-

tors with curved edges (26, 27, 28, 29), the reciprocally adjacent edges (26, 28) of said shelves (24, 25) being tangent inside



the body (4) of the cell (1) when the articulated members (12) are in the closed position.

4,571,899

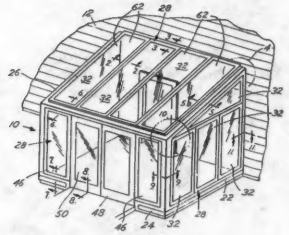
ROOM ADDITION CONSTRUCTION

Mearl Minter, Oskaloosa, Iowa, assignor to Rolscreen Company, Pella, Iowa

Continuation-in-part of Ser. No. 448,634, Dec. 10, 1982, and a continuation-in-part of Ser. No. 270,822, Jun. 5, 1981. This application Apr. 28, 1983, Ser. No. 489,514

Int. Cl.[4] E04D *1/36*

U.S. Cl. 52—60 **19 Claims**



1. An expansion joint assembly for weatherproofing a joint between a pair of panel units positioned on each side of a frame member, comprising:

a cap support attached to said frame member and having opposite upstanding outer arms each terminating in an upper edge;

a joint cap secured to said cap support, and having opposite downwardly extending outer legs each terminating in a lower edge;

said lower edges of said outer legs of said joint cap being closely spaced above said upper edges of said outer arms of said cap support so as to define a slot therebetween; and

a pair of joint flashings each having a first end attached to one of said panel units and an opposite second free end laterally movably extending into one of said slots between said cap support and said joint cap so as to permit expansion and contraction of said panel units and said upper and lower edges being in substantially linear engagement with said flashing whereby said flashing is pivotally received within said slot so as to permit movement of said panel units.

4,571,900

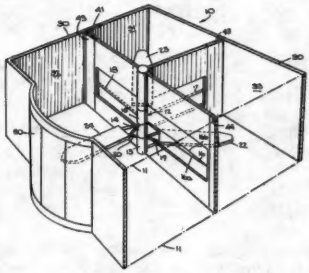
SURGICAL OPERATING ROOM STRUCTURE

Charles D. Kelman, North Shore Towers, 269 Grand Central Pkwy., Bldg 3, Floral Park, N.Y. 11005

Filed Sep. 26, 1983, Ser. No. 535,608

Int. Cl.[4] E04B *1/346*

U.S. Cl. 52—65 **13 Claims**



1. A surgical operating room structure comprising:

a central core;

a housing surrounding said core and forming a work space at its interior;

a plurality of generally outwardly extending curtain means within said housing for dividing the work space into a plurality of compartments;

a plurality of spaced arms supported by and extending generally radially outwardly from the core and movable in circumferential direction thereabout, each of said arms extending into said housing at above-floor level and being adapted to support an operating table;

said curtain means each comprising a movable portion adapted to be opened to permit movement of an arm therethrough from one compartment into the next adjacent compartment and adapted to be closed again subsequent to each such movement;

whereby a patient already on an operating table may enter the structure in a first compartment where the operating table is supported by the arm in that compartment, and said arm supporting the operating table and patient is then rotated through the curtain means separating said first compartment from an adjacent second compartment, into said adjacent second compartment.

4,571,901

VANDAL-RESISTANT SECURITY VIEW PORT

Earl L. Morris, La Habra Heights, and V. Walter Hafner, Whittier, both of Calif., assignors to Acorn Engineering Company, City of Industry, Calif.

Filed Mar. 16, 1984, Ser. No. 590,565

Int. Cl.[4] E04H *3/08*

U.S. Cl. 52—106 **14 Claims**

1. A vandal-resistant security view port assembly mounted over an opening in a cell wall for permitting observation into a cell, said view port and wall assembly comprising:

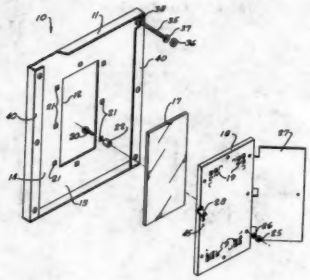
a cell wall having a thickness of at least about six inches, said cell wall having a cell surface and a chase surface and said cell wall having a generally rectangular opening therethrough, said opening being large enough to permit a viewer's head to enter said opening;

a support frame attached over said opening in said cell wall on the cell surface thereof, said support frame having a front plate having at least one opening therethrough, said

front plate having a cell facing surface and a chase facing surface;

fastening means affixed to said front plate, said fastening means being affixed near the periphery of said openings;

pan means affixed to the chase facing surface of said front plate by said fastening means, said pan means having at least one opening therethrough and said pan means being supported only by said support frame;



door means hingedly held, said door means being moveable between a first position when said door means covers said opening in said pan means or said frame and a second position when it permits viewing through said opening;

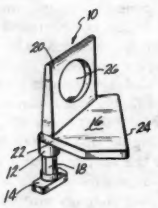
lens means held against the chase surface of the front plate by said pan means, said lens means completely covering and extending past said opening in said front plate.

4,571,902

PANEL MOUNTING SYSTEM AND METHOD FOR MOUNTING PANELS

Richard E. Liebetrau, 237 Petrie Rd., Cadillac, Mich. 49601

Filed Nov. 16, 1983, Ser. No. 552,406
Int. Cl.[4] E04G *21/04*
U.S. Cl. 52—127.2 **12 Claims**



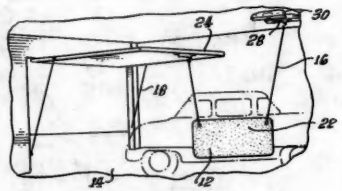
1. In a building glazing system having a plurality of closely spaced adjacent panels secured to a structural member by an adhesive wherein said adjacent panels are held in place against the force of windloads until said adhesive is fully cured comprising a slot provided on said structural member, a panel mounting temporary retainer having first and second portions, said first portion comprising a body having means for securely receiving said panel mounting temporary retainer in said slot on said structural member in a rotatable fashion for holding said panel mounting temporary retainer rigidly on said structural member and said second portion comprising a body having means extending therefrom for holding said plurality of closely spaced adjacent panels in place relative to said structural member during the application and curing of the adhesive, said means for holding said plurality of closely spaced adjacent panels in place comprises a flange having a circumferential shape such that when said panel mounting temporary retainer is in a first position said flange holds a first panel in place while allowing a second panel to be located in place and when in a second position said flange holds both said first panel and said second panel in place.

4,571,903

AUTOMOBILE DENT PROTECTION SYSTEM

Martin F. Strassner, 10401 Balboa Blvd., Granada Hills, Calif. 91344

Filed Aug. 31, 1984, Ser. No. 646,648
Int. Cl.[4] E04H *14/00*
U.S. Cl. 52—173 R **6 Claims**



1. An assembly for protecting cars against dents from doors of adjacent cars, comprising:

a pad having an extent in the order of two feet high by five feet long for the protection of the side of a car from the opening of doors of adjacent parked cars;

means for hanging said pad from above the cars to be protected in a garage, carport or the like, in a location where said pad provides optimum protection from adjacent vehicles;

means for shifting said pad from one location to another while said pad remains suspended from said hanging means; and

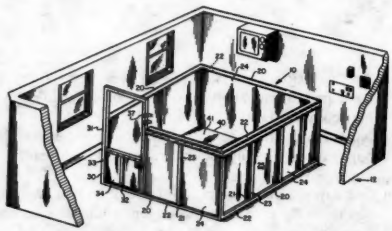
said hanging means including at least two ropes for supporting said pad, and at least one of said ropes is coupled to the garage door, whereby said pad is moved in its location as the garage door is raised and lowered.

4,571,904

PATIENT ENCLOSURE

Laibe A. Kessler, and Jean M. Walsh, both of Pittsburgh, Pa., assignors to Allegheny-Singer Research Corporation, Pittsburgh, Pa.

Filed Oct. 6, 1983, Ser. No. 539,580
Int. Cl.[4] E04H *3/08*
U.S. Cl. 52—205 **7 Claims**



1. A patient enclosure treatment center comprising:

A. an outer room formed of a floor, a plurality of walls and a ceiling, said outer room being environmentally pleasant; and

B. an inner enclosure positioned on said floor, free of furniture, sides of which are visually closed and a top of which is open to the environment of said outer room and formed from:

i. a barrier extending vertically from the floor about the periphery of said inner enclosure to a height about the shoulder height of the patient, said barrier formed of a frame including a plurality of spaced vertical members retained in an assembled position by upper and lower horizontally disposed support members, a door frame and a door disposed in the lower portion of said door frame for entering and exiting said inner enclosure, said door being lower than said barrier frame so as to permit viewing the interior of said enclosure, and said door frame extending vertically above the barrier frame, said barrier padded on its interior surface and covered with a soft, easily maintained material, and

ii. a padded floor within the periphery of said inner enclosure lying on top of said floor and contacts the lower portion of barrier, said inner enclosure being of a size sufficient to allow a patient to move freely within said inner enclosure.

4,571,905

METHOD OF MOUNTING CURTAIN WALL UNITS AND CONSTRUCTIONS THEREOF

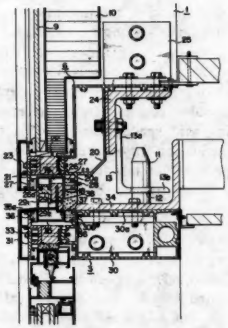
Hiromitsu Kaminaga, Kurobe, Japan, assignor to Yoshida Kogyo K.K., Tokyo, Japan

Filed Apr. 13, 1984, Ser. No. 600,178

Claims priority, application Japan, Apr. 18, 1983, 58-56757; Apr. 18, 1983, 58-67110

Int. Cl.⁴ E04B *2/88*

U.S. Cl. 52—235 **1 Claim**



1. A construction of mounting curtain wall units comprising a mullion with front and back sides, hook means secured to said back side of said mullion constituting a curtain wall unit, a building body with a front surface, a supporting member secured to said front surface of said building body for engagement with said hook means, projecting member provided to be projected upwardly spaced apart from each other on an upper edge portion of the curtain wall unit and a seal member, a lower edge portion of the curtain wall unit having a groove at a position corresponding to said seal member and engaging therewith, and bracket means secured to said lower edge portion of the curtain wall unit, an engaging portion of said bracket means formed at a position corresponding to said projecting member and engaging therewith, characterized in that said projecting member and seal member provided on the upper edge portion of a lower one of a pair of vertically adjacent curtain wall units are respectively engaged with the engaging portion of said bracket provided on the lower edge portion of the upper unit and the groove of the lower edge portion, said hook means being engaged with said supporting member wherein said engaging portion formed in the bracket secured to the lower edge portion of the curtain wall unit comprises an elongated hole extending in a direction parallel to the curtain wall surface, whereby the curtain wall unit to be mounted is moved in a direction parallel to the curtain wall surface.

4,571,906

SECTIONAL SCREENS

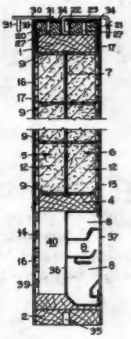
Geoffrey B. Ashton, Adelaide, Australia, assignor to Geoffrey Ashton Pty. Ltd., Adelaide, Australia

Filed Oct. 11, 1983, Ser. No. 540,446

Claims priority, application Australia, Apr. 19, 1983, PF8963

Int. Cl.⁴ E04B *2/74*

U.S. Cl. 52—239 **9 Claims**



1. A portable space divider screen which comprises a panel having a head and bottom rails joined by end rails to form a perimeter frame, and an intermediate rail joined to infill means between the head rail and intermediate rail and means to join a said panel to other panels comprising pairs of sockets in at least the top rail of the panel to receive pins on connectors adapted to interconnect two panels, a septum between the said head and intermediate rails extending to said end rails, said infill means being over said septum and comprising multiple cellular members on each side of said septum with the cells containing sound absorbent material, perforated wall members enclosing the said infill means on both sides of the said panel, covers of sound absorbing fabric over the said perforated wall members, a longitudinal slot at the upper face of the upper rail and a longitudinal slot at the lower face of the bottom rail, ducts to contain electrical wiring longitudinally extending along between the bottom rail and the intermediate rail of the said panel, and skirtings also longitudinally extending along the lower portions of the said panel and disposed to cover the said ducts and adapted to support electrical switching and power outlets.

4,571,907

FRAME CONNECTOR SYSTEM

Jerry A. DeFouw, Grand Rapids, and James O. Kelley, Spring Lake, both of Mich., assignors to Herman Miller, Inc., Zeeland, Mich.

Filed Aug. 15, 1984, Ser. No. 641,189

Int. Cl.⁴ F16C *1/06*

U.S. Cl. 52—239 **21 Claims**

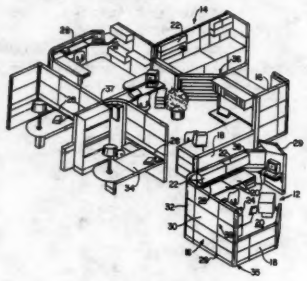
1. A connector for rigid frames, each of which has elongated stiles extending the length of opposite ends thereof, each stile having an edge face with an indented channel running along the length thereof and shaped to form a hollow channel with an abutting edge face of an adjacent frame stile said connector comprising;

an elongated draw tube positioned within the hollow channel and having a cross-sectional shape complementary to the hollow channel so as to fit snugly therein;

interengaging wedge means on the draw tube and the stiles

so as to draw the abutting edge faces of adjacent frame stiles together upon relative longitudinal movement of the draw tube with respect to the frame stile; and

mechanical advantage adjusting means between the adjacent



frame stiles and the draw-tube wedge means to forcibly shift the draw tube lengthwise and thereby draw the adjacent frame stiles tightly together, the elongated draw tube and the hollow channel being shaped to provide lateral shear strength between adjacent frames.

4,571,908

FORMWORK ELEMENT OF BRICK SIZE

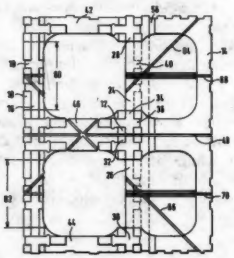
Manfred Bruer, Postfach 63 12 27, D-6204 Taunusstein 1, Fed. Rep. of Germany

Filed Apr. 18, 1984, Ser. No. 601,491

Claims priority, application Fed. Rep. of Germany, Apr. 21, 1983, 3314516

Int. Cl.⁴ E04C *1/00*

U.S. Cl. 52—309.4 **4 Claims**



1. A formwork element of brick size for forming horizontal wall projections, e.g. for supporting an outer wall covering or facing, comprising an inner wall the upper side of which is formed with a tongue and/or groove extending along the length thereof for form-locking engagement with formwork elements of the next row, a discontinuous outer wall connected via stems to the inner wall and an outwardly protruding formwork part having a cavity which via a break in the outer wall is in communication with an interspace between said outer wall and the inner wall, characterized in that said element is made of hard foam and a bearing surface on an upper side of the inner wall of formwork elements of the next row in an area opposite a break in the outer wall is lowered by less than the height of a tongue or groove but to such a degree that the load-bearing surfaces of the inner wall and of the outer wall are substantially equally loaded.

4,571,909

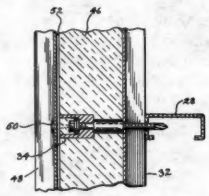
INSULATED BUILDING AND METHOD OF MANUFACTURING SAME

Thomas G. Berghuis, Appleton, and James A. Propson, Hilbert, both of Wis., assignors to Keller Structures, Inc., Kaukauna, Wis., a part interest

Filed Sep. 7, 1984, Ser. No. 649,834

Int. Cl.⁴ E04C *1/00, 2/34;* **E04B** *1/74, 2/00*

U.S. Cl. 52—309.8 **14 Claims**



1. An insulated building comprising:

an inner structure forming the interior walls and roof of the building;

spacer means mounted on the exterior of said inner structure, said spacer means extending at intervals along the walls and roof of said inner structure and comprising elongated members, said elongated members being located at a distance from the exterior of said inner structure, said elongated members being mounted on said inner structure by fasteners, so constructed as to avoid a heat transfer path through the insulation, said fasteners being applied at intervals along said elongated members;

insulating foam covering the entire exterior of said inner structure except for the areas occupied by said fasteners, said insulating foam covering to a depth generally flush with the outer edges of said spacer means, said foam embedding said spacer means and forming a seamless, integral insulation for the building; and

sheeting applied over said foam and spacer means to cover the foam on the exterior of the building.

4,571,910

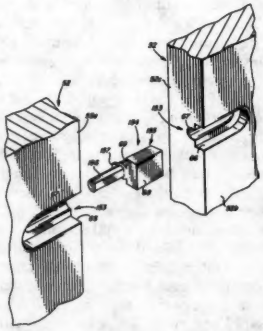
APPARATUS FOR LAYING TILE

Edward Cosentino, 6075 Pelican Bay Blvd., Naples, Fla. 33940

Filed Aug. 1, 1983, Ser. No. 519,053

Int. Cl.⁴ E04F *13/00, 19/02*

U.S. Cl. 52—391 **10 Claims**



1. Apparatus for laying tiles on a supporting surface comprising

a tile having a decorative front face and a rear face intended

to be bonded to a bed of mortar applied to the supporting surface,

the rear face of the tile having a plurality of elongated grooves which extend towards the middle of the rear face from each of the edges in a direction substantially perpendicular to each of these edges,

each of said grooves having at least one undercut part in cross section,

the distance between the bottom of each groove and the front face of the tile being exactly equal for all the grooves,

a plurality of elongated spacer elements each including an attachment portion and a support portion which are aligned with each other and have lengths slightly less than the length of the grooves,

the attachment portion of each spacer element having a profile with a cross sectional shape substantially the same as the cross sectional shape of the grooves,

the support portion of each spacer element having a profile with a cross sectional area substantially less than the cross sectional area of the undercut part of the groove and a maximum width which is less than the width of the opening into the undercut part of the groove,

the support portion having a rectangular flange projecting at 90° from its end adjacent the attachment portion,

the attachment portions of respective spacer elements being axially force-fitted one into each of the grooves which open into adjacent edges of the tile constituting 50 percent of the edges of the polygonal tile, one face of the flange of each spacer element bearing against the edge of the tile adjacent thereto, and

the support portion of each spacer element projecting from the tile and having a longitudinal support surface the distance of which from the front face of the tile is equal to the distance between this face and the bottom of each groove.

4,571,911

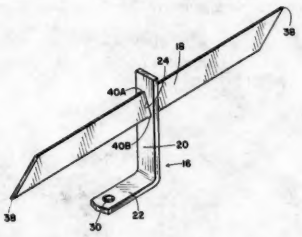
MODULAR INSULATION ANCHOR

David R. Dunlap, Claremore, and Eugene N. Brown, Broken Arrow, both of Okla., assignors to Refractory Anchors, Inc., Broken Arrow, Okla.

Filed Dec. 12, 1983, Ser. No. 560,536

Int. Cl.⁴ E04C *1/40*

U.S. Cl. 52—509 **8 Claims**



1. An insulation supporting apparatus for use in attaching blanket insulation to a surface, comprising:

an elongated stud member having a longitudinal axis and a first end and a second end and having means at the first end for attachment to a surface to be insulated and having an elongated rectangular opening adjacent the second end, the elongated slot having a longitudinal axis, the plane of said longitudinal axis of said elongated slot intersecting the plane of said stud member longitudinal axis at an angle from 20° to 60°; and

an elongated tine member having a longitudinal axis and being of rectangular cross-sectional configuration to be slideably and non-rotatably receivable in said rectangular slot in said stud member wherein said longitudinal axis of the tine member extends substantially perpendicular to a plane and said stud member longitudinal axis, at least one end of the tine member being pointed to receive blanket insulation impaled thereon.

4,571,912

OVERHEAD ANCHORING TRACK

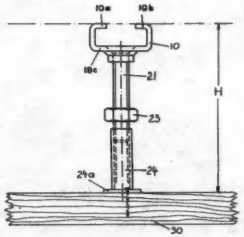
Siegfried Fricker, Wurmberger Str. 30-34, 7135 Wiernsheim, Fed. Rep. of Germany

Filed Mar. 4, 1985, Ser. No. 707,512

Claims priority, application Fed. Rep. of Germany, Mar. 2, 1984, 3407801

Int. Cl.⁴ E04B *1/38*

U.S. Cl. 52—710 **11 Claims**



1. An anchoring track adapted to be embedded in the surface of a structural member of cast concrete, having a C-shaped channel as a main body with a row of openings in the web portion of the channel shape surrounded by recesses and an outwardly extending anchoring element connected to each opening, characterized in that the recesses are in the form of eye sockets (**11**) with a conical portion and an adjoining neck portion (**11*a***) which have a bore oriented perpendicularly to the longitudinal axis of the channel shape (**10**), that each neck portion (**11*a***) is adapted to engage the shaft portion (**21**) of an anchoring screw (**20**) adjacent to its head (**22**), and that the head (**22**) of the anchoring screw (**20**) is arranged on the inner side of the web portion (**10*c***), so as to engage the conical portion of the eye socket (**11**), and at least one additional member is threadable onto the distal extremity of the anchoring screw (**20**), for the purpose of anchoring and/or positioning the anchoring track in relation to the structural member.

4,571,913

PREFABRICATED FIREPROOF STEEL AND CONCRETE BEAM

Jean-Baptiste Schleich, Kockelscheuer; Erwin Laboda, Dahlem; Jean-Paul Lickes, Kayl, and Emile Reuter, Dudelange, all of Luxembourg, assignors to Arbed S.A., Luxembourg, Luxembourg

Filed Apr. 24, 1984, Ser. No. 603,509

Claims priority, application Luxembourg, Apr. 25, 1983, 84772

Int. Cl.⁴ E04C *3/34*

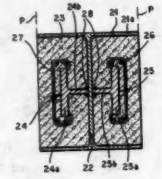
U.S. Cl. 52—722 **9 Claims**

1. A composite structural element comprising:

a longitudinally extending main steel beam having a web and at least two flanges extending therefrom, having oppositely directed outer faces, having outer edges generally defining a plane, and defining with the web a longitudinally extending recess open away from the web between the outer edges;

a longitudinally extending mass of concrete filling the reces substantially to the plane, the outer flange faces being exposed and substantially free of concrete; and

another profiled steel beam fixed to the web of the main beam, extending longitudinally generally the full length of



the main beam, and wholly imbedded in and covered by the concrete mass.

4,571,914

SELF-FRAMING STRUCTURAL METAL RIBLATH WALL

Dimiter Stoyanoff, 1055 Ocean Blvd., SE., Stuart, Fla. 33494

Filed Aug. 10, 1984, Ser. No. 639,468

Int. Cl.[4] E04B *1/00*

U.S. Cl. 52—747 **1 Claim**

1. A method of constructing a self-framing structural metal riblath wall, comprising:

providing an upright riblath having a first face facing the exterior of the structure for which the wall is being provided and a second face facing the interior of tthe structure, the riblath being comprised of a plurality of adjacent, substantially coplanar panels, the panels being comprised of a plurality of ribbed sections joined by solid, substantially v-shaped portions projecting out of the plane of the panels and having their apices directed toward the interior of the structure for which the wall is being provided, the successive panels being joined by substantially triangular offsets projecting out of the plane of the panel for joining adjacent panels, the triangular offset being formed by bending out of the plane of the panels the section of each panel which adjoins another panel to form the triangular offset, the apex of each triangular, load bearing offset being pointed in the direction of the interior of the structure;

applying exterior wall material to the first face of the riblath to provide an exterior wall therefor, and for filling the triangular offset and v-shaped portions to provide load bearing structure within the wall;

attaching a substantially horizontal brace to the v-shaped portions between the sections to prevent displacement of the sections in a horizontal direction when the wall is in an upright position; and

attaching an interior wall to the second face of the riblath, the interior wall being fixed adjacent the apex of the triangular offset.

4,571,915

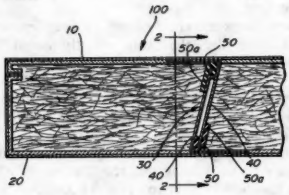
FIREPROOF AND SOUNDPROOF DOOR

Mohan Barman, Willowdale, Canada, assignor to Produits d'Acier Anjou, Inc., Ville d'Anjou, Canada

Filed Jan. 20, 1984, Ser. No. 572,248

Int. Cl.[3] E04C *2/54*

U.S. Cl. 52—785 **7 Claims**



1. In a door or the like having spaced-apart planar side panel members and baffle means intermediate the members, the baffle means comprising at least a pair of elongated planar members with one of each pair secured to and extending from a respective side panel member such that the planar members of each pair lie in spaced parallel relation one to another and extend toward the other side panel in overlapping arrangement and the free edges of the planar members terminate in spaced relation with the panel members, the improvement comprising spacer means adjacent said free edges and between panel members said spacer means comprises a first plurality of spaced elongated members adjacent the free edges of one of said planar members and a second plurality of spaced elongated members adjacent the free end of the other of said planar members, said first and second pluralities of members being arranged in staggered relation whereby to prevent direct contact therebetween and to provide an interrupted staggered sound passage between said planar members.

4,571,916

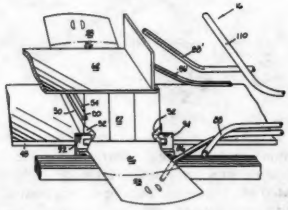
SECONDARY PACKAGING MACHINE

Michael S. Meuwly, West Monroe; James A. Roberts, Monroe; James F. Gilbert, West Monroe, all of La.; Daniel V. Clavert, Grand Junction, Colo., and James B. P. Green, Jr., West Monroe, La., assignors to Southern Tool Company, West Monroe, La.

Filed Dec. 5, 1983, Ser. No. 558,729

Int. Cl.[4] B65B *11/10, 49/04, 7/20*

U.S. Cl. 53—48 **3 Claims**



1. A machine for packaging a plurality of articles in a wrap-around carton wherein the carton has a bottom panel, two side panels, inner and outer top panels and end panels connected to the side panels by tuck flaps comprising:

means for segregating a selected number of articles to be packaged from an infeed conveyor, said segregating means comprising an elevating means for elevating the selected articles from the level of the infeed conveyor to

the level of a machine bedplate while holding back other articles on the infeed conveyor;

means for engaging the articles to transport the selected articles downstream through the machine until the packaging operation is completed;

said means comprising spaced apart flight bars, said flight bars each having a container engaging protrusion centrally located on a downstream side of a respective flight bar, said protrusion extending less than a full width of said respective flight bar for engaging the selected articles so as to avoid interference with the formation of the carton about the articles;

means for feeding a substantially flat carton blank beneath the selected articles as the articles are transported downstream through the machine with the bottom panel of the carton being located beneath the articles, the side panels and top panels being located on the sides of the articles and the end panels leading and trailing the articles;

means for engaging the tuck flaps of the carton blank and the side panels of the carton blank to elevate and retain side panels, top panels and end panels to upright positions around the selected articles while the carton is being formed from the blank, said means for engaging the tuck flaps causing the tuck flaps to be positioned between the side panels and the selected articles;

means for folding the inner top panel down onto the selected articles and retaining the inner top panel there while adhesive is applied to at least one of the top panels;

means for applying adhesive to at least one of the top panels;

means for folding the outer top panel down onto the inner top panel and for pressing the top panels together until the adhesive has set and the selected articles are packaged.

4,571,917

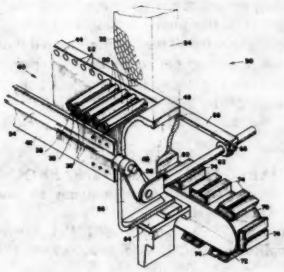
APPARATUS FOR PACKING OVAL CIGARETTES

Jack C. Wheless, and Richie H. Dickerson, both of Richmond, Va., assignors to Philip Morris Incorporated, New York, N.Y.

Continuation of Ser. No. 532,661, Sep. 13, 1983, abandoned, which is a continuation-in-part of Ser. No. 496,352, May 19, 1983, abandoned. This application Dec. 3, 1984, Ser. No. 677,254

Int. Cl.[4] B65B *19/04*

U.S. Cl. 53—148 **4 Claims**



1. An apparatus for packing rod-shaped articles of oval cross section, said apparatus comprising:

separating means for separating the articles into a plurality of separate streams in respective paths, said separating means comprising a plurality of vanes for separating the articles into said streams, each of said vanes having first and second ribs disposed at first and second spaced-apart lateral positions on one side thereof and a third rib disposed on the other side thereof at a third lateral position intermediate said first and second spaced-apart lateral positions to aid in guiding the articles between said vanes;

receiving bed means for receiving the articles from said separating means with a first angular orientation, said receiving bed means comprising a plurality of troughs having inclined planar side surfaces for receiving such articles in said first angular orientation, said troughs being equal in number to said streams; and

means for pushing a group of the articles from said receiving means, with each article of the group in a predetermined packing orientation, into a container located at a packing position.

3. An apparatus for packing oval-shaped smoking articles of oval cross section, said apparatus comprising:

separating means for separating the articles into a plurality of separate streams in respective paths;

receiving bed means for receiving the articles from said separating means with a first angular orientation, said receiving bed means comprising a plurality of troughs for receiving articles in said first orientation, said troughs being equal in number to said streams and being spaced apart in an extended position for receiving said articles, each of said troughs receiving one of the articles at a time, and further comprising means for moving said troughs together from said extended position to achieve a predetermined packing orientation; and

means for pushing a group of the articles from said receiving bed means, with each article of the group in said predetermined packing orientation, into a container located at a packing position.

4,571,918

APPARATUS FOR FORMING CIGARETTE GROUPS

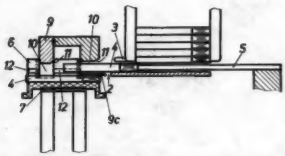
Joachim Zeitel, Hagen, Fed. Rep. of Germany, assignor to Maschinenfabrik Alfred Schmermund GmbH & Co., Gevelsberg, Fed. Rep. of Germany

Filed Nov. 20, 1984, Ser. No. 673,416

Claims priority, application Fed. Rep. of Germany, Nov. 22, 1983, 3342048

Int. Cl.[4] B65B *19/10*

U.S. Cl. 53—149 **6 Claims**



1. Apparatus for forming articles to be packaged into multilayer groups, each group comprising a plurality of the articles, said apparatus comprising:

storage magazine means, said magazine means having a number of outlets commensurate with the number of layers which will define the group of articles to be formed, said magazine means outlets being offset from one another in first and second generally transverse directions, the offset in the second direction between adjacent outlets being equal approximately to the thickness of a layer of the articles, said outlets having a length commensurate with the number of articles which define the layer associated therewith;

conveyor means, said conveyor means including a plurality of receiving cells for the articles, said receiving cells being separated by a distance commensurate with the offset between said magazine outlets in said first direction, said conveying means moving said cells in a conveying direction in stepwise fashion whereby individual of said cells will be serially placed in registration with said magazine means outlets;

ram means for causing transfer of articles from said magazine means via said outlets into said conveying means cells; and

stationary retaining means, said retaining means cooperating

with said conveying means cells to define article receiving regions therein and to retain articles transferred into said cells in position in the cells during movement thereof, said retaining means including:

at least a first elongated member, said first member having an article retaining edge which extends generally in a direction parallel to the direction of movement of said conveying means cells, said retaining edge being contoured so as to permit the transfer of articles from said magazine means into said conveying means cells via said outlets; and

at least first tongue-like extension of said retaining means, said first extension being in the region of a second magazine means outlet in the direction of motion of said cells, said first extension and said retaining edge cooperating to define a receiving region within a cell for a layer of articles transferred from said magazine means via said second outlet, further movement of the cell in the conveying direction resulting in withdrawal of the tongue from the cell.

4,571,919

APPARATUS TO HANDLE PHOTOGRAPHIC DISC FILMS

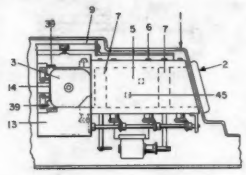
Roberto Signoretto, Olmo di Martellago, Italy, assignor to Photo Engineering International s.r.l., Venice, Italy

Filed Oct. 5, 1983, Ser. No. 539,097

Claims priority, application Italy, Oct. 6, 1982, 84142 A/82

Int. Cl.[4] B65B *43/38, 5/04*

U.S. Cl. 53—266 R **11 Claims**



1. An apparatus for handling photographic disk films comprising a light-proof casing, an entrance passageway for closed disk film cartridges on the light-proof casing, a light-proof storage magazine for disk films in the light-proof casing and spaced from said entrance passageway, said magazine having an internal spit onto which disk films are placed one after another following removal of the disk films from their cartridges, a cartridge opening blade in the path of movement of disk film cartridges between the entrance passageway and said magazine, a disk film cartridge transport unit movable along a linear path between said entrance passageway and magazine and including a drive motor and additional power means to act on each disk film cartridge during transport to prepare it for opening by said blade, and resiliently biased rotary disk film engaging and supporting means on said transport unit and being operable to take each disc film from its opened cartridge and index the film for proper placement on said spit of the magazine when the transport unit has moved to a location adjacent to the magazine, and means for closing said light-proof storage magazine after it has been filled with a predetermined number of disc films.

4,571,920

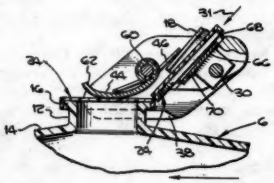
BEER KEG CAPPING MACHINE

Henry P. Roach, Reseda, and Jeffrey W. Gunn, Thousand Oaks, both of Calif., assignors to APV Burnett & Rolfe, Inc., Chatsworth, Calif.

Filed Nov. 29, 1983, Ser. No. 556,156

Int. Cl.[4] B65B *7/28*

U.S. Cl. 53—300 **2 Claims**



1. A keg capping machine for automatically capping a sequence of kegs, such as those used for beer, travelling on a generally horizontal conveyor, each keg having an upwardly disposed neck portion with a circumferential flange, the keg capping machine comprising:

a frame;

an inclined feeder chute supported by said frame for transporting caps;

a capping head attached to the lower end of said chute, said capping head having spaced sideplates each having a horizontal bottom flange directed toward the other flange and forming spaced horizontal guideways so that the lowermost cap is fed from the chute between said sideplates and is initially restrained by said guideways with the leading edge of said cap below the guideways, said guideways having open longitudinal ends so that as a keg is moving into position to be capped its neck moves between said sideplates with its flange passing through said opening over said guideways, striking the cap below its center and rotating it toward a horizontal position; and

a curved capdriving rocker suspended between said sideplates having spring means which normally urge it into engagement with the guideways so that when a keg is being capped the cap and the circumferential flange of the keg neck are squeezed between said rocker member and said guideways and the cap thus becomes firmly fastened upon the neck of the keg.

4,571,921

EXPENDABLE HEATER SEALING PROCESS

Sumner H. Wolfson, Tucson, Ariz., assignor to Burr-Brown Corporation, Tucson, Ariz.

Division of Ser. No. 298,786, Sep. 2, 1981, Pat. No. 4,507,907.

This application Jan. 9, 1985, Ser. No. 689,876

Int. Cl.[4] B65B *51/14, 7/28*

U.S. Cl. 53—373 **1 Claim**

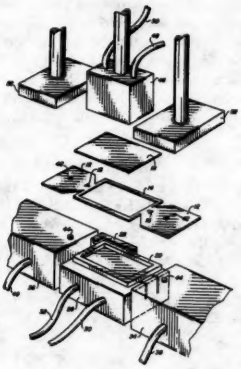
1. An apparatus for effecting a hermetic seal between an electronic component package and its lid wherein a sealing preform having first and second contact tabs is placed between said package and said lid and contacts the sealing surfaces thereof, comprising:

(a) a stage onto which said package, preform and lid is positioned;

(b) first means for applying pressure to said package, preform and lid in a direction so as to compress said preform; and

(c) second means for heating said preform to effect said seal, said second means having a third means for passing an electrical current through said preform, said third means includes: (a) first and second terminal blocks on which

said first and second tabs are positioned; (b) first and second plungers for securing said first and second tabs on



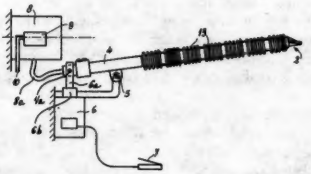
said first and second terminal block; and (c) a source of current coupled to said first and second terminal blocks.

4,571,922

METHOD AND APPARATUS FOR THE PREPARATION OF A SAUSAGE CASING PACKAGE

Remy Steffen, Aspres-sur-Buesch, France

Filed Jan. 27, 1984, Ser. No. 574,680
Claims priority, application France, Feb. 1, 1983, 83 01901
Int. Cl.[4] B65B *15/00*
U.S. Cl. 53—397 5 Claims



1. A method of forming a successive casing package which comprises the steps of:

longitudinally folding an elongated sausage casing support;

inserting the longitudinally folded sausage casing support into a tube having a low-friction external surface;

threading directly onto said tube a succession of sausage casings and pleating each sausage casing as it is drawn onto said tube while fitting each successively threaded sausage casing partly over an end of a previously threaded sausage casing to form an assembly of sausage casings directly on said tube; and

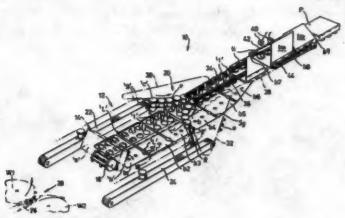
simultaneously withdrawing said casing support from said tube and drawing said assembly off said tube and onto the withdrawn support thereby transferring said assembly to said support and forming said package.

4,571,923

PACKAGING MACHINE AND METHOD

Philippe A. Le Bras, 13, Rue De La Bievre, 36000 Chateauroux, France

Filed Nov. 19, 1984, Ser. No. 683,746
Claims priority, application United Kingdom, Dec. 19, 1983, 8333706
Int. Cl.[4] B65B *21/24*
U.S. Cl. 53—398 3 Claims



1. A method for wrapping a plurality of cup-shaped containers arranged in two rows in a wrapper of the type having a base panel, side wall panels joined to the base panel along longitudinal side edges thereof, and top wall portions joined to said side wall panels along fold lines remote from said side edges of the base panel and arranged to be folded into overlapping relationship, said base panel being provided with two rows of apertures for receiving the lower portions of said containers and reinforcing tabs struck from said apertures and joined thereto along fold lines remote from said longitudinal side edges of said base panel and substantially parallel thereto, which method comprises the steps of

(a) continuously feeding a series of wrapper blanks in substantially flat condition from an infeed section toward an outfeed section of a packaging machine,

(b) folding said reinforcing tabs out of the plane of said blanks into substantially upright position,

(c) simultaneously advancing two linear series of containers into longitudinal alignment with said wrapper so that each container is moved into a postion directly above said wrapper,

(d) causing each container to be located in one of said apertures while the containers and said wrapper are conveyed in synchronism,

(e) folding the upper portions of said reinforcing tabs outwardly to overlie the tops of the associated containers,

(f) folding the side walls into substantially upright position and folding one of the top wall portions into generally horizontal position to overlie the tops of the adjacent containers,

(g) folding the other top wall portion into face contacting relationship with the exposed surfaces of said reinforcing tabs and overlapping relationship with said one top wall portion,

(h) securing said top wall portions together in overlapping relationship.

4,571,924

METHOD AND APPARATUS OF MANUFACTURING POROUS POUCHES CONTAINING GRANULAR PRODUCT

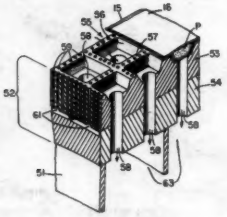
Abdul S. Bahrani, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Apr. 29, 1985, Ser. No. 728,070
Int. Cl.[4] B65B *47/00*
U.S. Cl. 53—453 53 Claims

31. A process for making a porous laminated sheet product having at least one compartment formed therein and containing a predetermined quantity of inner product within said compartment, said process comprising the following steps:

(a) placing a first porous web of material in contact with a compartment-forming surface, said compartment-forming surface having at least one cavity adapted to be selectively placed in fluid communication with a vacuum source, said cavity being surrounded by peripheral land areas having at least one aperture formed therein adapted to be selectivelyplaced in fluid communication with a source of pressurized fluid whereby outward fluid flow can emanate from at least a portion of said peripheral land areas;

(b) selectively placing said at least one cavity in fluid communication with said vacuum source and selectively placing said at least one aperture in fluid communication with said source of pressurized fluid;



(c) depositing a quantity of inner product on the upper surface of said first porous web such that the vacuum source acting through said first porous web tends to hold said inner product against the upper surface of said first porous web in said cavity, while said pressurized fluid acting through said first porous web tends to keep said inner product from being deposited on the upper surface of first porous web in said peripheral land areas; and

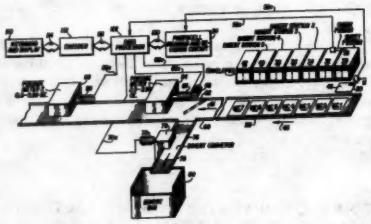
(d) supplying a second web of material and laminating the lower surface of said second web to the upper surface of said first porous web along said peripheral land areas, thereby forming one or more porous compartments sealed about their periphery.

4,571,925

INSERTION MACHINE WITH POSTAGE CATEGORIZATION

Jerryl Adams, Easton, Pa., assignor to Bell and Howell Company, Phillipsburg, N.J.

Filed Jun. 9, 1983, Ser. No. 502,891
Int. Cl.⁴ G01G *23/28*
U.S. Cl. 53—502 **38 Claims**



1. In an insertion machine of the type in which an insertion track moves groups of items past a different one of a plurality of feed stations during each machine cycle, said plurality of feed stations being adapted to selectively feed items onto said track for inclusion with a group of said items, wherein the improvement comprises:

data processing means including memory means and arithmetic logic means;

means for selectively inputting into said data processing memory means with respect to each selected station a predetermined value indicative of the per item weight of items held at said station;

means including said data processing arithmetic logic means for using said predetermined values indicative of the per item weight of items held in said feed stations to obtain a calculated total weight for each group of items; and,

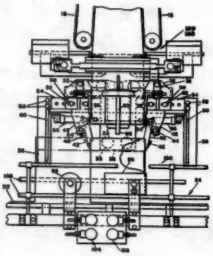
means for using said calculated weight total to determine how each group of items is to be processed by the insertion machine relative to the application of postage to an envelope associated with said group of items.

4,571,926

APPARATUS FOR FORMING, FILLING AND DEPOSITING FILLED BAGS INTO CARTONS

John W. Scully, Raynham, Mass., assignor to Pneumatic Scale Corporation, Quincy, Mass.

Continuation of Ser. No. 50,973, Jun. 22, 1979, abandoned. This application May 3, 1982, Ser. No. 374,002
Int. Cl.⁴ B65B *1/22, 9/10*
U.S. Cl. 53—525 **4 Claims**



1. Apparatus for forming, filling and depositing filled bags into cartons comprising a hollow mandrel upon which a sheet of flexible material is formed into a tube with a side seam, sealing and severing means supported below the mandrel for producing transverse seams to form bags and for severing respective bags from the tube to release the same, a stationary shape-retaining device defining a vertically-elongate passage below the sealing and severing means for constraining the filled bags to substantially the interior cross section of the cartons within which they are to be deposited, a conveyor positioned below the shape-retaining device for supporting cartons for movement into alignment with the mandrel to receive the filled bags when released and means for moving the conveyor to position cartons one-at-a-time in a position below the shape retaining device to receive a filled bag and thereafter to move the filled carton away characterized in that the shape-retaining device is situated at a level exceeding the height of the cartons into which the filled bags are to be deposited to enable moving cartons into position for filling and out of position following filling while a filled bag is suspended in the shape-retaining device, and further characterized in that there is blow-down means for ejecting jets of air downwardly against the sides of the bag within the shape-retaining device.

4,571,927

PACKING APPARATUS

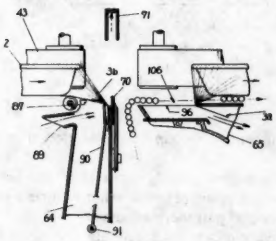
Tadoru Suga, Ibaraki, Japan, assignor to Ibaraki Seiki Co., Ltd., Osaka, Japan

Filed Jan. 23, 1984, Ser. No. 572,747
Int. Cl.⁴ B65B *9/10, 49/14*
U.S. Cl. 53—547 **14 Claims**

1. An improvement in a packing apparatus for wrapping a flexible and extensible film around trays having articles therein, said apparatus including a conveyor for transporting said trays, a mechanism for supplying to said trays while said trays are being transported by said conveyor a band of said film

at a same speed as that of said conveyor and to wrap each of said trays by said film in a tubular shape, a cutting mechanism for cutting said tubular film wrapping each of said trays between successive said trays in a transport direction thereof, and a mechanism for folding downwardly leading and trailing ends of said film cut by said cutting mechanism and for sticking said ends to a bottom surface of corresponding said trays, said improvement comprising:

(a) air suction means comprising a first air suction channel mounted upstream of the cutting mechanism for turning downwardly a said leading end of said film cut by said cutting mechanism and a second air suction channel mounted downstream of the cutting mechanism for turning downwardly a said trailing end of said film cut by said cutting mechanism, said first and second air suction channels being spaced apart a distance such that they are disposed between successive said trays in a transport direction thereof during a cutting operation with respect to said cutting mechanism, said first and second air suction channels each comprising air inlets open upwardly respectively, a first film holding means and a second film holding means being located within said first and second air suction channels respectively for holding therein said leading and trailing ends of said film taken in through said air inlets respectively;



(b) a side-belt mechanism for laterally sandwiching said trays wrapped by said tubular film and for forcibly transporting them so that said trays are allowed to pass through said cutting mechanism and said first and second air suction channels to thereby downwardly fold toward the bottom surface of each of said trays a said leading end of said film held by said first film holding means within said first air suction channel; and

(c) a roller mechanism of endless-belt type for moving under said trays at a higher speed than that of said side-belt mechanism to thereby fold downwardly toward the bottom surface of each of said trays a said trailing end of said film held by said second film holding means within said second air suction channel, said roller mechanism providing an opening matching with said air inlet at said second air suction channel, said first air suction channel being provided in the vicinity of its said air inlet with a first bypass port and said first holding means within said first air suction channel comprising a first damper which normally closes said first bypass port and swings to open said first bypass port when said film to be cut by said cutting mechanism closes said air inlet, whereby a said leading end of said film taken in through said air inlet of said first air suction channel is held between said damper and an inner wall of said first air suction channel.

4,571,928

SPLICING HEAD OPERATED BY COMPRESSED AIR

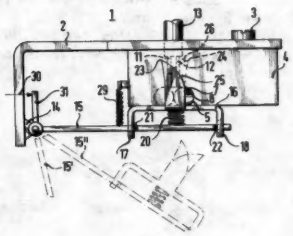
Joachim Rohner, Monchen-Gladbach, Fed. Rep. of Germany, assignor to W. Schlafhorst & Co., Monchen-Gladbach, Fed. Rep. of Germany

Filed Apr. 11, 1984, Ser. No. 599,174

Claims priority, application Fed. Rep. of Germany, Apr. 13, 1983, 3313323

Int. Cl.⁴ B65H *69/06*; D01H *15/00*; D02J *1/08*

U.S. Cl. 57—22 **2 Claims**



1. In an automatic splicing device, a splicing head operable by pressurized gas for producing a knotless thread connection by splicing, the splicing head being formed with at least two pressurized-gas openings for mutually entangling, interwining, intermixing and/or winding-around fibers of threads to be joined together which are receivable in a splicing channel formed in the splicing head, wherein the threads are spliced and having thread and air guides for guiding the respective threads and the pressurized gas at both terminating ends of the splicing channel for asymmetrically covering the terminating ends so that only part thereof remains open for passing the threads therethrough, comprising a cover for the splicing channel with which the thread and air guides are connected, and means for withdrawing said cover from the splicing channel.

4,571,929

DEVICE FOR THE DOSAGE AND INJECTION OF A SMALL QUANTITY OF LIQUID INTO THE SPLICING AIR OF A PNEUMATIC YARN SPLICING DEVICE

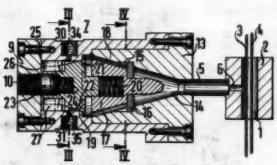
Josef Bertrams, Wegberg, Fed. Rep. of Germany, assignor to W. Schlafhorst & Co., Moenchengladbach, Fed. Rep. of Germany

Filed Jun. 29, 1984, Ser. No. 626,407

Claims priority, application Fed. Rep. of Germany, Jul. 2, 1983, 3323884

Int. Cl.⁴ D01H *15/00*

U.S. Cl. 57—22 **3 Claims**



1. Device for dosing and injecting a small quantity of liquid into the splicing air entering the splicing chamber of a pneumatic yarn splicing device from a compressed-air source, comprising a compressed-air tube leading to the splicing chamber, a liquid container, and a combined dosing and atomizing valve connected between the compressed-air source and said compressed-air tube for conducting splicing air to said compressed-air tube, said valve having a dosing chamber formed therein

receiving a given quantity of liquid, and said valve including means operated by splicing air from the compressed-air source for alternately connecting said dosing chamber to said liquid container and to the compressed-air source for injecting said given quantity of liquid into the splicing chamber.

4,571,930

AUTOMATIC DOFFING DEVICE FOR RING SPINNING AND/OR TWISTING FRAMES, IN PARTICULAR IN MACHINES FOR PRODUCING LARGE PACKAGES

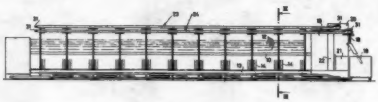
Natale Chiari, and Giuseppe Inverardi, both of Cologne Bresciano, Italy, assignors to Officina Meccanica Tessile Edera S.p.A., Cologne Bresciano, Italy

Filed Mar. 12, 1984, Ser. No. 588,706

Claims priority, application Italy, Nov. 16, 1982, 24278 A/82

Int. Cl.[4] D01H *9/08, 9/14*

U.S. Cl. 57—274 **7 Claims**



1. A spinning machine having a row of spindles, a first overhead conveyor mounted above the spindles for empty bobbins to be delivered to the respective spindles, a second overhead conveyor mounted above the spindles parallel to the first conveyor for the removal of wound bobbins received from the respective spindles, independent drive means for the respective conveyors, empty bobbin supports on the first conveyor, wound bobbin supports on the second conveyor, gripper assemblies for the respective spindles, and means for moving the gripper assemblies vertically and horizontally as between the respective spindles and the first and second overhead conveyors for transferring wound bobbins from the spindles to the wound bobbin supports on the second conveyor and for delivering empty bobbins from the empty bobbin supports on the first conveyor to the spindles.

4,571,931

SPINNING AND WINDING PLANT

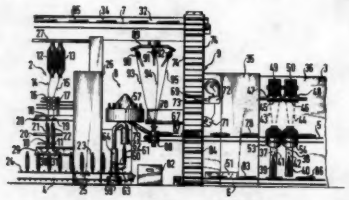
Wilhelm Küpper, Wegberg, Fed. Rep. of Germany, assignor to W. Schlafhorst & Co, Moenchengladbach, Fed. Rep. of Germany

Filed Nov. 19, 1984, Ser. No. 673,020

Claims priority, application Fed. Rep. of Germany, Nov. 19, 1983, 3341895

Int. Cl.[4] D01H *9/00, 9/18;* **B65H** *54/22*

U.S. Cl. 57—281 **17 Claims**



1. Spinning and winding plant, comprising at least one ring spinning machine, at least one winding machine, at least one first spool conveyor and at least one first tube sleeve conveyor disposed at said ring spinning machine, at least one second spool conveyor and at least one second tube sleeve conveyor disposed at said winding machine, at least one spool transfer station disposed between said first and second spool conveyors, at least one tube sleeve transfer station disposed between said first and second tube sleeve conveyors, a spool storage device with a predetermined number of storage locations at said spool transfer station, means for emptying said spool storage device in sequence with the requirement for spools at said winding machine, means for filling a given maximum number of said storage locations with spools supplied by said ring spinning machine, and means for filling a maximum number of said storage locations with at least partly filled spools ejected and returned from said winding machine.

4,571,932

FRICTION SPINNING ROLLER ARRANGEMENT

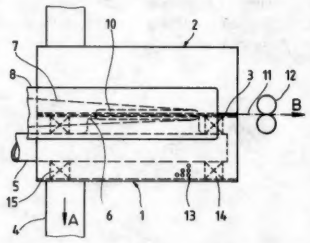
Fritz Stahlecker, Josef-Neidhart-Strasse 18, 7347 Bad Überkingen, and Hans Stahlecker, Haldenstrasse 20, 7334 Süssen, both of Fed. Rep. of Germany, assignors to Hans Stahlecker and Fritz Stahlecker, both of, Fed. Rep. of Germany

Filed Jul. 2, 1984, Ser. No. 626,929

Claims priority, application Fed. Rep. of Germany, Jul. 2, 1983, 3323988

Int. Cl.[4] D01H *1/135, 7/882*

U.S. Cl. 57—401 **25 Claims**



1. An arrangement for open end friction spinning of yarn comprising:

two friction rollers rotably drivable in the same direction and disposed adjacent one another to form a yarn forming wedge-shaped gap therebetween,

fiber supplying means for supplying individual fibers to the wedge shaped gap,

yarn withdrawal means for withdrawing yarn from the wedge-shaped gap in the longitudinal direction of said wedge-shaped gap,

and differential radial force means for applying differential radial force to the forming yarn at different alternatingly arranged axial zones of the wedge-shaped gap, said alternatingly arranged axial zones comprising a cyclical arrangement of high and low radial force zones.

4,571,933

OPEN-END FRICTION SPINNING MACHINE HAVING A PLURALITY OF SPINNING UNITS

Fritz Stahlecker, Bad Überkingen, Fed. Rep. of Germany, assignor to Hans and Fritz Stahlecker, Fed. Rep. of Germany

Filed Oct. 23, 1984, Ser. No. 663,690

Claims priority, application Fed. Rep. of Germany, Nov. 9, 1983, 3340435

Int. Cl.[4] D01H *1/135, 1/241*

U.S. Cl. 57—401 **20 Claims**

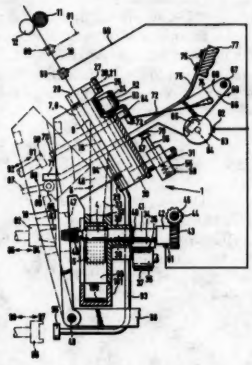
1. An open end friction spinning apparatus comprising:

a plurality of spinning units, each said unit comprising two friction rollers arranged adjacent to one another to form a wedge-shaped yarn-forming gap therebetween;

common drive means engaging a plurality of said spinning units, wherein said common drive means comprises belt drive means;

at least one rotatable spring loaded tension pulley means associated with each spinning unit for engaging said belt

drive means, said pulley means causing said drive belt means to engage said rollers, and



automatic disengaging means for disengaging each said tension pulley means from said belt drive means thereby disengaging said belt means from said roller means.

4,571,934

CHAIN WITH CHAIN LINKS OF WELDED ROUND MATERIAL

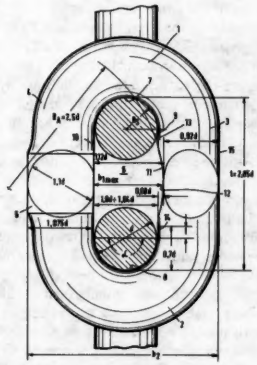
Werner Rieger, Aalen-Unterkochen; Hans H. Dalferth, Aalen-Wasseralfingen, and Franz Eberhardt, Aalen, all of Fed. Rep. of Germany, assignors to RUD-Kettenfabrik Rieger & Dietz GmbH u. Co., Aalen, Fed. Rep. of Germany

Filed Jan. 26, 1983, Ser. No. 461,238

Claims priority, application Fed. Rep. of Germany, Feb. 5, 1982, 3204287

Int. Cl.⁴ F16G *13/06*

U.S. Cl. 59—90 **12 Claims**



1. Chain with chain links of a welded round material, in particular round steel, in which noses of successive chain links have, in the region of contact points and viewed in a central link plane, supporting arcs with a radius of curvature R_s which is virtually equal to half the diameter d of the round material, and in which the chain links have, at least at one point, an inner width b_1 of the size of at least 1.1 times the diameter d of the round material, said supporting arcs being joined together by two longitudinally oriented chain legs, said supporting arcs and said chain legs defining a closed clear inner space (6) therebetween, characterized in that the radius of curvature R_s extends over a supporting arc angle α of 180°, at least a portion of one of said chain legs (3) defining an arcuate indentation adjacent to and directed away from said clear inner space (6), one of said chain legs being an unwelded leg (3) and one of said chain legs (4) being a welded leg, said arcuate indentation (11) being defined only on a portion of said unwelded leg (3), said unwelded leg (3) having, with a straight outer boundary line (15), in the central link plane a cross-section which is widened perpendicular to the central link plane, said welded leg (4) being straight.

4,571,935

PROCESS FOR STEAM COOLING A POWER TURBINE

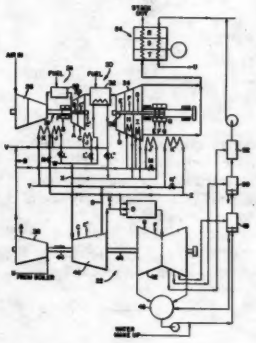
Ivan G. Rice, P.O. Box 233, Spring, Tex. 77373

Continuation of Ser. No. 416,172, Sep. 9, 1982, abandoned, which is a continuation-in-part of Ser. No. 274,660, Jun. 17, 1981, Pat. No. 4,384,452, which is a division of Ser. No. 47,571, Jun. 11, 1979, Pat. No. 4,314,442, and a continuation-in-part of Ser. No. 224,496, Jan. 13, 1981, Pat. No. 4,438,625, which is a division of Ser. No. 954,832, Oct. 26, 1978, Pat. No. 4,272,953.

This application Jan. 16, 1985, Ser. No. 691,732

Int. Cl.⁴ F02C *7/16, 7/26, 6/18*

U.S. Cl. 60—39.05 **24 Claims**



1. A method of producing work by means of a turbomachine comprising a gas compressor and a gas turbine, said gas turbine comprising an outer casing confining the blading thereof, said method comprising; compressing ambient air in said gas compressor, igniting said compressed air in a combustor to form a heated gas, expanding said heated gas through the blading of said gas turbine, heating said outer casing before start up of said turbomachine to thermally expand said outer casing and increase the tip clearance between said blading and said casing, cooling said outer casing during expansion of said heated gas through the blading of said turbine to control the tip clearance between said casing and said blading and heating said outer casing and thermally expanding said outer casing after trip out of said gas turbine to prevent the blade tips from rubbing said casing during coast down.

4,571,936

LENGTH ADJUSTABLE STRUT LINK WITH LOW AERODYNAMIC DRAG

Dudley O. Nash, Cincinnati, and James A. Crowley, Westchester, both of Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jul. 10, 1985, Ser. No. 753,462

Int. Cl.⁴ F02C *7/20*; B64D *27/16*

U.S. Cl. 60—39.31 **13 Claims**

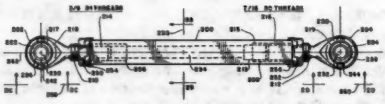
1. In combination:

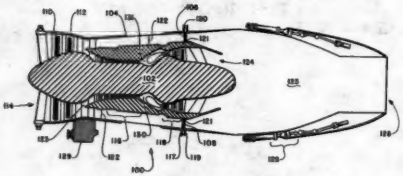
an aircraft jet engine;

an engine housing concentrically surrounding said engine and separated therefrom by an annular air flow space;

fan means within said housing and connected with said jet engine for generating high velocity axial air flow in said annular air flow space along the length of said engine and housing;

a structural link body member disposed across said annular airflow space between said jet engine and engine housing, said link body member having an air foil cross-section lengthwise disposed in said axial airflow in said annular airflow space;





and including means for limiting pivotal movement of said link body member about its longitudinal axis; and

differentially threaded termination means for connecting respective ends of said link body member with said jet engine and said engine housing;

whereby lengthwise disposition of said air foil cross-section in said axial airflow and high resolution adjustment of the annular space between said jet engine and said housing are simultaneously achievable.

4,571,937

APPARATUS FOR CONTROLLING THE FLOW OF LEAKAGE AND COOLING AIR OF A ROTOR OF A MULTI-STAGE TURBINE

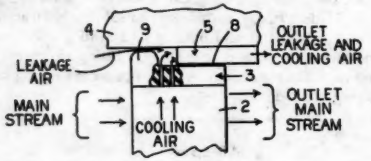
Martin Albers, Munich, Fed. Rep. of Germany, assignor to MTU - Motoren-und Turbinen-Munchen GmbH, Munich, Fed. Rep. of Germany

Filed Mar. 6, 1984, Ser. No. 586,835

Claims priority, application Fed. Rep. of Germany, Mar. 8, 1983, 3308140

Int. Cl.[4] F01D *5/18, 5/20*

U.S. Cl. 60—39.75 **9 Claims**



1. A multi-stage turbine comprising a casing, a rotor in said casing for extracting energy from an inlet fluid stream and discharging the fluid stream, at a low pressure discharge end of the rotor, at a given direction to a subsequent turbine stage, said rotor including a plurality of spaced rotor blades and a peripheral shroud on said blades to cover the blades, said shroud having holes for passage therethrough of cooling air which flows radially outwards from the blades, said shroud and casing forming a leakage path for flow of leakage air between the shroud and casing, and a stationary guide assembly secured to said casing and extending between said shroud and casing, said guide assembly including guide grid means for receiving said cooling air and said leakage air to combine the same and guide it for discharge from the rotor to the subsequent turbine stage at said direction substantially corresponding to the angle of discharge of said fluid stream from said rotor, said guide assembly being axially offset relative to said rotor blades at the low pressure discharge ends thereof.

4,571,938

EXHAUST GAS CLEANING DEVICE FOR DIESEL ENGINES

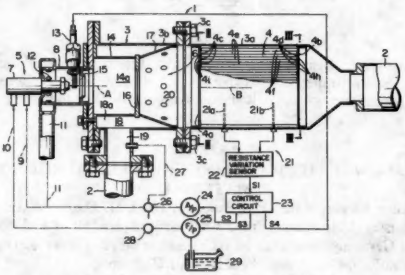
Shigeru Sakurai, Hiroshima, Japan, assignor to Mazda Motor Corporation, Hiroshima, Japan

Filed Aug. 26, 1983, Ser. No. 526,884

Claims priority, application Japan, Aug. 27, 1982, 57-149729

Int. Cl.[4] F01N *3/02*

U.S. Cl. 60—303 **7 Claims**



1. An exhaust gas cleaning device for diesel engines which comprises filter means provided in exhaust gas passage means of the diesel engine for trapping particulate materials in exhaust gas passing through the exhaust passage means, burner means upstream of the filter means for burning the particulate materials deposited on the filter means, said filter means having gas inlet surface means which is substantially perpendicular to an axial direction along which the exhaust gas is substantially passed and where the particulate materials are apt to be deposited, said burner means including fuel nozzle means and cylindrical combustion chamber means for effecting combustion of fuel from the fuel nozzle means, engine exhaust gas introduction means positioned between said fuel nozzle means and said filter means, mixing chamber means provided between said combustion chamber means and said filter means for drawing the engine exhaust gas to mix it with combustion gas from the combustion chamber means, said burner means, said mixing chamber means and said filter means being arranged in a line, said mixing chamber means having inlet means communicating with said combustion chamber means and outlet means opposite to said inlet means, said mixing chamber means being defined by wall means which flares outwardly from one end adjacent to said combustion chamber means to the other end which is adjacent to the filter means, said wall means having a diametrical dimension at said other end which is substantially equal to that of the gas inlet surface means of said filter means and so that said gas inlet surface means of the filter means is completely exposed to said mixing chamber means at the outlet means thereof, said mixing chamber wall means being formed with a plurality of perforations, exhaust gas chamber means provided around said mixing chamber means and around said combustion chamber means so that all the exhaust gas from said exhaust gas chamber means enters the mixing chamber means through said perforations in the wall means and downstream of said combustion chamber means, said fuel nozzle means being provided in support tube means which is smaller

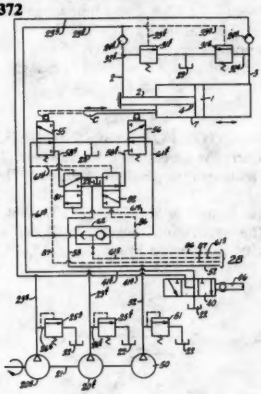
in diameter than the combustion chamber means and provided at an end of the combustion chamber means opposite to the mixing chamber means, ignition means provided in the support tube means in the vicinity of the fuel nozzle means, air inlet means for drawing air into the support tube means around the fuel nozzle means so that the air is mixed with the fuel injected from the fuel nozzle means.

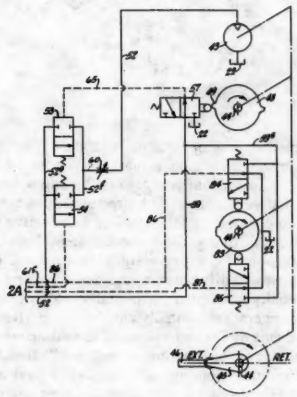
4,571,939

HYDRAULIC WELL PUMP

William W. Dollison, Dallas, Tex., assignor to Otis Engineering Corporation, Dallas, Tex.

Filed Dec. 14, 1982, Ser. No. 449,823
Int. Cl.[4] F15B *15/18*
U.S. Cl. 60—372 **16 Claims**





1. A system for operating a sucker rod string connected with a well pump comprising:

a double-acting fluid cylinder having opposing power ends;

means for connecting said cylinder with said sucker rod string for raising and lowering said string to operate said pump;

means for supplying pressurized fluid alternately to the cylinder ends including a direction control movable between extend and retract conditions to extend and retract said cylinder;

drive means for shifting said direction control;

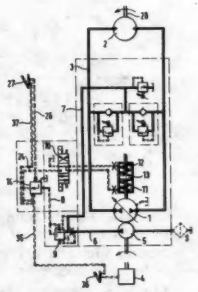
control means for operating said drive means responsive to the extend and retract movements of said cylinder; including limit valves positioned to simulate the hydraulic cylinder extend and retract stroke end locations, said limit valves being movably mounted for changing the location of each limit valve and the distance between said limit valves for selectively adjusting the length of the strokes of said hydraulic cylinder and the end limit of the extend and retract strokes of said cylinder, cam operator means for opening and closing each of said limit valves at said end locations and means connecting said cam operator means with said hydraulic cylinder whereby said cam operator means simulates the extend and retract strokes of said hydraulic cylinder, said means connecting including a flexible cable secured at a first end with said hydraulic cylinder and connected with said cam operator means to move said cam operator means; movable sheave means connected with said cam operator means and fixed sheave means spaced from said movable sheave means, means biasing said movable sheave means away from fixed sheave means, and said cable is reeved over said movable and fixed sheave means and secured along the second end thereof at a fixed location; and means for applying a fluid counterbalancing force into said cylinder for offsetting the combined weights of said sucker rod string, a production fluid column in a well bore above said pump, and movable surface equipment supported on said cylinder.

4,571,940

CONTROL DEVICE FOR A HYDROSTATIC GEAR DRIVEN BY A DRIVE ENGINE

Johann Wuchenauer, Bibertal, Fed. Rep. of Germany, assignor to Hydromatik GmbH, Elchingen, Fed. Rep. of Germany

Continuation of Ser. No. 377,167, May 11, 1982, abandoned. This application Jan. 22, 1985, Ser. No. 693,814
Claims priority, application Fed. Rep. of Germany, May 21, 1981, 3120278
Int. Cl.[4] F16H *39/46*
U.S. Cl. 60—444 **5 Claims**



1. In combination, a hydrostatic transmission driven by a drive engine having a movable speed control element, a control device for the hydrostatic transmission, a hydro-pump and/or hydro-motor having a setting mechanism, an auxiliary pump which is driven synchronously with the drive engine to produce a control pressure which is adjustable via a control valve and which is dependent on the speed of the drive engine, the control pressure being present in a control line which is connected to the setting mechanism of the hydro-pump and/or hydro-motor of the hydrostatic transmission, the control device comprising a pressure reduction valve provided in the control line and externally controllable to shut off the control pressure, the pressure reduction valve comprising a servo valve spool which separates a first control chamber connected

to said auxiliary pump and a second control chamber connected to a pressure drain and which, via reciprocally opening or closing restrictors, selectively connects the portion of the control line leading to the setting mechanism of the hydropump and/or hydro-motor to either or both of the first and second control chambers, the servo valve spool having a piston area with an associated cylinder chamber via which the servo valve spool can be loaded with control pressure in the direction of opening of the control line to the pressure drain against the force of a compression element, means arranged to adjust the force of said compression element against said servo valve spool to shut off the control pressure, the cylinder chamber being connected to the portion of the control line leading to the setting mechanism via a check valve opening in the direction of flow to the cylinder chamber, a two-way valve parallel to the check valve, and two-way valve control means for opening and closing the two-way valve in response to the operation of the speed control element of the drive engine whereby said means arranged to adjust the force of said compression element and said two-way valve control means act indepenedently upon the overall pressure reduction valve.

4,571,941

HYDRAULIC POWER SYSTEM

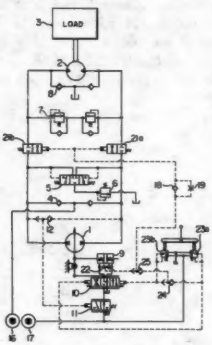
Yukio Aoyagi; Eiki Izumi; Sotaro Tanaka, all of Ibaraki, and Takeshi Yamaguchi, Tsuchiura, all of Japan, assignors to Hitachi Construction Machinery Co, Ltd., Tokyo, Japan

Filed Dec. 22, 1981, Ser. No. 333,555

Claims priority, application Japan, Dec. 27, 1980, 55-187132; Dec. 27, 1980, 55-187134; Feb. 13, 1981, 56-19067

Int. Cl.³ F16H *39/46*

U.S. Cl. 60—466 **18 Claims**



1. A hydraulic power system comprising a variable displacement hydraulic pump, a hydraulic motor driven by said hydraulic pump for actuating a load of a relatively large inertia, said pump and motor being connected to constitute a closed hydraulic circuit, hydraulic servo means operated by a hydraulic fluid supplied through a fluid supply line from a hydraulic source for controlling a displacement volume of said pump in accordance with an operation of input means, and pressure control valve means connected in said fluid supply line and responsive to a main line pressure in said closed hydraulic circuit for reducing the supply of said hydraulic fluid to said servo means so as to prevent said main line pressure from exceeding a predetermined level when the main line pressure increases due to the inertia of the load, wherein:

motor stop means for preventing, in an operative position thereof, said motor from rotating;

first control means responsive to the operation of said input means for enabling the motor stop means to be released from the operative position not later than when said motor is caused to rotate when said input means is operated to initiate rotation of said motor and to be held released from the operative position when said input means is operated to continue rotation of said motor;

means including said servo means and said pressure control valve means for watching said main line pressure to hydraulically detect a condition of rotation of said motor and generate a signal indicative of a rotation of said motor when said input means is operated to return to its neutral position, said motor rotation signal comprising a change in condition caused by the operations of said servo means and pressure control valve means in combination; and

second control means responsive to said motor rotation signal for enabling said motor stop means to be released from the operative position whereby said motor stop means is maintained in a release from from the operative position when said motor is still caused to rotate due to the inertia of said load after said input means is operated to return to its neutral position, while it is brought into the operative position in the absence of said motor rotation signal when said motor completely ceases to rotate.

4,571,942

SERVOMOTOR FOR ASSISTED BRAKING

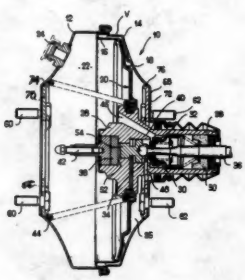
Jean-Jacques Carre, Montreutl, and Yves Meyer, Tauerny, both of France, assignors to Societe Anonyme D.B.A., Paris, France

Continuation-in-part of Ser. No. 157,907, Jun. 9, 1980, abandoned. This application Nov. 15, 1982, Ser. No. 441,717

Claims priority, application France, Jun. 15, 1979, 79 15413

Int. Cl.⁴ B60T *13/00*

U.S. Cl. 60—547.1 **13 Claims**

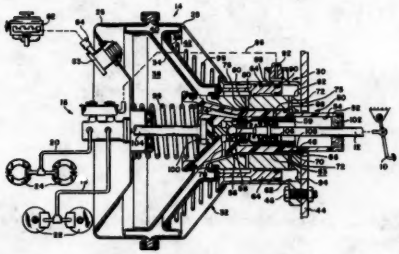


1. A servomotor to be operationally located between a stationary wall in a vehicle and a master cylinder of a brake system of said vehicle, said servomotor having a housing, a drive piston that separates a first pressure chamber from a second pressure chamber in said housing, and a valve member for selectively controlling fluid displacement between said chambers in response to a brake signal to create a pressure differential across said drive piston, said housing being made of two shells mutually assembled peripherally, each of said shells including a peripheral substantially axial sleeve portion and an annular central end wall which is coaxial to said sleeve portion, said sleeve portion of at least one of said shells being axially off-set from the corresponding said annular central end wall and connected thereto by a connecting thin web integral with said annular central end wall and having, in a radial plane, a progressively evolutive profile, and fixing means for connection respectively to said stationary wall and to said master cylinder, wherein said at least one shell further includes a reinforcing annular member located against and having substantially the same radial extension as said annular central end wall and force transmittingly linked to the corresponding said fixing means, said reinforcing annular member having a peripheral edge portion shaped to matingly cooperate in bearing engagement with the adjacent portion of the smaller diameter of said connecting thin web.

4,571,943
TANDEM BRAKE BOOSTER WITH HYDRAULIC MECHANISM FOR REAR DIAPHRAGM FORCE REVERSAL

Robert F. Gaiser, Stevensville, Mich., assignor to Allied Corporation, Morristown, N.J.

Filed Mar. 1, 1984, Ser. No. 585,082
Int. Cl.[4] F15B *7/00, 17/02;* B60T *13/58;* F01B *31/14*
U.S. Cl. 60—560 **12 Claims**

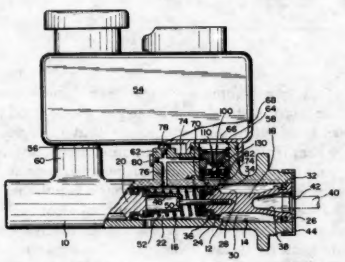


1. A vacuum brake booster comprising a housing with a cavity receiving at least a pair of diaphragms dividing the housing cavity into a plurality of chambers, the housing movably carrying a valve assembly operable to control communication of fluid pressure to one of said plurality of chambers in order to move said pair of diaphragms in opposite directions during braking and impart separate forces to said valve assembly for movement of the latter in one direction so that a power assist is generated during the brake application, characterized in that said housing cooperates with said valve assembly to define an output pressure chamber, one of said plurality of diaphragms being movable in an opposite direction relative to movement of said valve assembly during the brake application, piston means operatively connected to said one of said diaphragms to generate fluid pressure in said output pressure chamber in response to movement thereof in said opposite direction to bias said valve assembly to move in said one direction during the brake application.

4,571,944
BLOW-OFF VALVE IN A QUICK TAKE-UP MASTER CYLINDER

Hitoshi Kubota, Fujisawa, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Continuation of Ser. No. 256,486, Apr. 22, 1981, abandoned. This application Nov. 21, 1983, Ser. No. 553,425
Claims priority, application Japan, Apr. 25, 1980, 55-55731
Int. Cl.[4] B60T *11/20*
U.S. Cl. 60—562 **2 Claims**



1. A quick take-up master cylinder for an automotive brake system having a primary and a secondary piston disposed in a bore in said cylinder and respectively defining therein independent primary and secondary pressure chambers for establishing a braking fluid pressure;

a variable volume take-up chamber for establishing a first fluid pressure therein as said primary piston moves towards said primary pressure chamber, said first fluid pressure being selectively supplied only to said primary pressure chamber to increase the braking fluid pressure therein, and being operable to at least partially establish said braking fluid pressure;

a pressure control valve means, for relieving said first fluid pressure whenever said first fluid pressure exceeds a set pressure, comprising:

a fluid passage connecting said quick take-up chamber to a fluid reservoir;

a pressure control valve disposed in said fluid passage, said pressure control valve being movable between a first position in which fluid communication between said quick take-up chamber and said fluid reservoir is blocked and a second position in which said fluid communication is established;

a bias spring for providing a biasing force to urge said pressure control valve towards said first position;

a set pressure adjusting means for adjusting said biasing force, said adjusting means including a movement against which said bias spring seats, said movement, in a first position thereof, being operable to maintain the biasing force at a first magnitude, said movement being movable to a shifted position wherein said biasing force is reduced;

a retainer means for resiliently biasing said movement toward said first position;

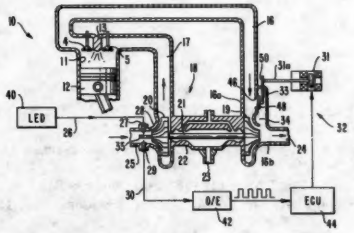
first hydraulic means for moving said pressure control valve to said second position when said first fluid pressure exceeds the biasing force of said bias spring; and

second hydraulic means for moving said movement to said shifted position whenever the fluid pressure in said primary pressure chamber exceeds the bias of said retainer means.

4,571,945
TURBOCHARGER CONTROL DEVICE WITH OPTICAL TURBOCHARGER SHAFT SPEED SENSING

Masami Inada, Kariya; Yasuhiro Kawabata, Anjo, and Motonobu Akagi, Kariya, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Japan

Continuation of Ser. No. 393,867, Jun. 30, 1982, abandoned. This application Sep. 24, 1984, Ser. No. 653,584
Claims priority, application Japan, Jul. 1, 1981, 56-103848
Int. Cl.[4] F02B *37/12*
U.S. Cl. 60—602 **4 Claims**



1. Turbocharger control device for use in conjunction with an internal combustion engine, comprising:

a turbine operatively connected to an exhaust manifold of the engine to be driven to rotate by exhaust gases;

a centrifugal compressor;

a shaft connecting said compressor for rotation with said turbine;

a casing surrounding, in part, said compressor and said shaft;

photo projecting means positioned adjacent to said shaft within said casing;

photo receiving means positioned diametrically opposite said photo projecting means on the opposite side and adjacent to said shaft within said casing;

said shaft being provided with a diametrically penetrating hole;

light source means;

first means for coupling said light source means and said photo projecting means in respect to the transmission of light and for isolating said light source means from said casing in respect to the transmission of vibration and heat, said first coupling means including said light source means being positioned distant from said casing and first optical fiber means connecting said light source with said photo projecting means such that an intermittent light pulse signal is transmitted through the shaft hole to said photo receiving means during rotation of said shaft;

converter means, including a photo-voltage converter; second means for coupling said converter means and said photo receiving means in respect to the transmission of light and for isolating said photo-voltage converter from said casing in respect to the transmission of vibration and heat, said second coupling and isolating means including said photo-voltage converter being positioned distant from said casing and second optical fiber means connecting said photo receiving means with said photo-voltage converter;

said photo-voltage converter generating an electrical signal in response to light pulse signals transmitted from said photo receiving means;

control means connected electrically to said converter means for generating a control signal in response to said electrical signal;

an actuator operatively connected to said control means for movement in response to said control signal;

an exhaust gas bypass passage connected between an exhaust manifold portion located upstream of said turbine and an exhaust manifold portion located downstream of said turbine; and

valve means operatively connected to said actuator and positioned in said exhaust gas bypass passage for controlling flow of exhaust gas in said passage in response to said control signal.

4,571,946

INTERNAL COMBUSTION ENGINE WITH RANKINE BOTTOMING CYCLE

Andreas Demopoulos, Marathias Doridos, Nomos Phokidos, Greece

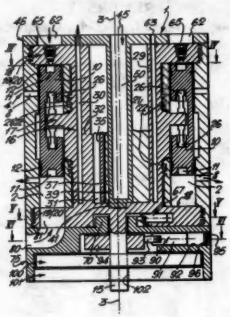
Filed Aug. 13, 1984, Ser. No. 639,941

Claims priority, application United Kingdom, Aug. 15, 1983, 8321910

Int. Cl.[4] F01K *23/10*

U.S. Cl. 60—618 **10 Claims**

1. An internal combustion engine comprising at least one piston reciprocally movable within a cylinder and interconnected with a rotary member of hollow form by cam means carried by the rotary member, whereby reciprocatory movement of the piston causes rotation of the rotary member, and auxiliary means for augmenting rotation of the rotary member, said auxiliary means comprising a closed circuit pressurized vapour system including an expander disposed within the hollow rotary member and interconnected therewith, whereby



mechanical energy obtained from expansion of the vapour in the expander is applied to the rotary member.

4,571,947

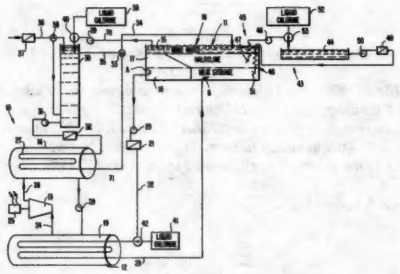
METHOD OF AND APPARATUS FOR TREATING THE WATER IN A SOLAR POND POWER PLANT

Lucien Y. Bronicki, Rehovot, Israel, assignor to Solmat Systems Ltd., Yavne, Israel

Continuation of Ser. No. 337,299, Jan. 5, 1982, abandoned. This application May 18, 1984, Ser. No. 611,393

Int. Cl.[4] F03G *7/02*; F24J *3/02*

U.S. Cl. 60—641.8 **13 Claims**



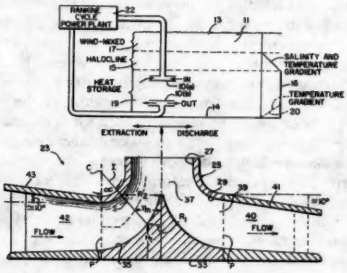
1. A method for treating the water in a solar pond power plant of the type comprising: a solar pond that has a stratified halocline interposed between an upper wind-mixed layer that receives solar radiation and a lower heat storage layer that absorbs heat from the solar radiation; a boiler through which brine from the heat storage layer is pumped for vaporizing an organic working fluid; a turbine through which the vaporized working fluid is expanded for driving an electrical generator that generates electricity; and a condenser for condensing working fluid exhausted from the turbine and returning the condensate to the boiler, the method including the steps of chlorinating the pond water by introducing chlorine into the halocline at a predetermined level of the halocline without disturbing it.

4,571,948

FLUID DIFFUSER AND METHOD FOR CONSTRUCTING THE SAME

Ira Orenstein, Reh. Moleho 3/8, Ramat Gan, Israel

Continuation of Ser. No. 445,192, Nov. 29, 1982, abandoned.
This application Nov. 27, 1984, Ser. No. 674,730
Int. Cl.[4] F17D *1/20*; F03G *7/02*
U.S. Cl. 60—641.8 16 Claims



15. Apparatus comprising:

(a) a salt water solar pond having a halocline with a downwardly directed salinity gradient interposed between an upper wind-mixed layer of brackish water for receiving incident solar radiation and a lower heat storage layer of concentrated brine for storing heat; and

(b) an extraction diffuser located in said heat storage layer for extracting heated brine therefrom, said extraction diffuser comprising:

(1) top and bottom circular plates having peripheral edges, one of said plates having a circular opening for connection to a conduit by which heated brine is removed from the heat storage layer, said plates having opposite, facing surfaces of revolution with a common axis established by said circular opening for defining first and second fluid flow paths, one end of the first flow path being defined by said circular opening, the other end of the first flow path being connected to one end of the second flow path whose other end is defined by the peripheral edges of said plates, said flow paths being oriented such that fluid traversing said flow paths is turned through 90°;

(2) said opposite, facing surfaces being constructed and arranged so that the cross-section of the second fluid flow path decreases continuously, throughout its length, in the direction of fluid flow towards said axis.

4,571,949

COGENERATION AND SLUDGE DRYING SYSTEM

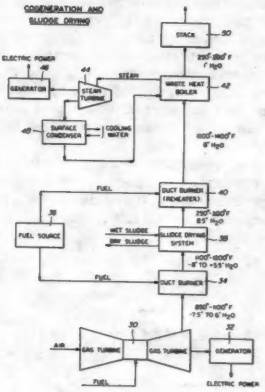
Harold C. Moke, 1420 Walnut Bend, Houston, Tex. 77042

Filed Apr. 18, 1985, Ser. No. 724,811
Int. Cl.[4] F01K *23/04*
U.S. Cl. 60—655 11 Claims

1. A system for cogeneration of electric power, said system including in combination,

sludge drying means having an air intake and an air exhaust, an input of wet sludge, and an output of dry sludge,

first generator means for generating electric power and connected to said air intake of said sludge drying means, and



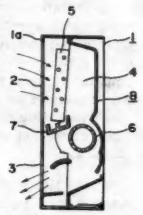
second generator means for generating electric power and connected to said air exhaust of said sludge drying means.

4,571,950

METHOD FOR CONTROLLING AIR-CONDITIONER

Shigeru Nariai, Kusatsu; Yasunori Himeno, Ohtsu, and Naoki Shimokawa, Shiga, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Aug. 16, 1984, Ser. No. 641,288
Claims priority, application Japan, Aug. 20, 1983, 58-152125
Int. Cl.[4] F25D *17/06*; F24F *7/00*
U.S. Cl. 62—89 6 Claims



1. A method for controlling an air-conditioner wherein an indoor fan for supplying air, cooled by an indoor heat-exchanger is driven at a predetermined speed immediately after the start of the cooling operation, but when and after the temperature inside the room has attained a preset temperature subsequent to the start of the cooling operation, the blowing capacity of the indoor fan is irregularly switched over between strong and weak states.

4,571,951

ELECTRONIC CONTROL FOR EXPANSION VALVE IN REFRIGERATION SYSTEM

Paul G. Szymaszek, Waukesha, Wis., assignor to Vilter Manufacturing Corporation, Milwaukee, Wis.

Filed Dec. 14, 1984, Ser. No. 681,633
Int. Cl.[4] F25B *41/00*
U.S. Cl. 62—212 3 Claims

1. A refrigeration system in which refrigerant is circulated and comprising:

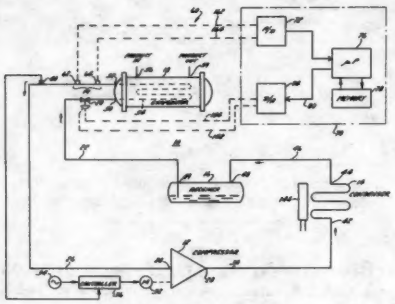
an evaporator having an inlet port and an outlet port for refrigerant;

an electrically operated adjustably controllable expansion valve connected to supply refrigerant to said inlet port;

and control means for measuring both the actual and saturation temperatures of refrigerant at a point near said outlet port of said evaporator and for adjusting said expansion valve in proportion to the temperature differential between both of said temperatures so that said expansion valve is adjusted toward closed position or open position when said temperature differential is below or above a predetermined value, respectively, said control means comprising:

a pressure sensing transducer in the form of a strain gauge for measuring refrigerant vapor pressure at said point;

a temperature sensing transducer in the form of a thermistor for measuring actual refrigerant temperature at said point;



each of said transducers providing analog electric output signals;

analog-to-digital converter means for converting said analog electric output signals to digital signals;

microprocessor means for converting the digital signals representing refrigerant vapor pressure to derived digital signals representing saturation temperature of said refrigerant, for measuring the differential temperature between said actual refrigerant temperature and said saturation temperature, and for providing digital output signals representing said temperature differential;

and digital-to-analog converter means for converting said digital output signals to analog control signals for adjustably controlling said expansion valve.

4,571,952

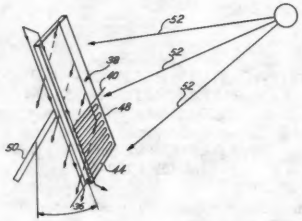
SOLAR AND CONVECTION ASSISTED HEAT PUMP SYSTEM

John B. Greenfield, Fort Smith, Ark., assignor to Rheem Manufacturing Company, Fort Smith, Ark.

Continuation of Ser. No. 250,083, Jun. 1, 1981, abandoned. This application Oct. 18, 1983, Ser. No. 542,898

Int. Cl.[4] F25B *27/00*

U.S. Cl. 62—235.1 **3 Claims**



1. In an improved solar and convection assisted heating and cooling reversible heat pump system for a building of the type including a coil outside of the building for energy transfer and a coil inside of the building for energy transfer, the improvement comprising:

an outside coil having an effective surface area oversized relative to the surface area of the inside coil in a ratio of at least 30 to 1, the outside coil comprising a black body the tube forming an outside panel through which air may flow and upon which light may radiate; and

mounting means for maintaining the outside panel oriented (a) distant from other structure so that both sides of the panel are within, and somewhat transverse to, an unobstructed path of prevailing region air flow, (b) with both sides of the panel open to air flow through the panel, (c) with one side of the panel oriented for solar energy incidence, and (d) in position to maximize heat transfer due to the simultaneous effects of (1) prevailing region air flow through the panel, (2) natural convection air flow around and through the panel, (3) moisture evaporation and condensation, and (4) radiant energy incidence of the panel wherein the panel position is a combination of a direction transverse to the prevailing region air flow, a horizontal position for maximum natural convection and evaporation and condensation energy transfer, and a direction transverse to the incidence of solar energy.

4,571,953

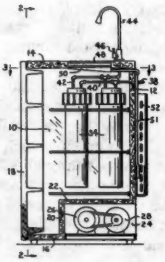
COMBINED REFRIGERATOR AND WATER FILTRATION UNIT

Louis F. Caruso, 1508 Viscaya Pkwy., Cape Coral, Fla. 33904

Filed Feb. 8, 1985, Ser. No. 699,728

Int. Cl.[4] F25D *23/12*

U.S. Cl. 62—339 **1 Claim**



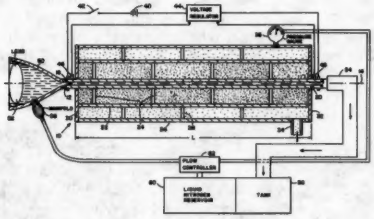
1. The combination with a refrigerator having a rectangularly shaped cabinet including a substantially flat top, a gooseneck water dispensing pipe projecting upwardly in one corner of the substantially flat top and having a downwardly directed water outlet, a perforated panel aligned with the downwardly directed water outlet, a pan positioned beneath and angled downwardly beneath the perforated panel, a discharge pipe communicating with the downwardly angled pan to dispense water spilled on the perforated panel, a refrigerated compartment in the rectangularly shaped cabinet, a water purification system comprising a chamber for the reception of water purification equipment, inlet and outlet passages to the chamber of the water purification system, means to releasably clamp the water purification chamber in the refrigerated compartment, a source of water supply, water inlets interconnecting the source of water supply to the inlet to the water purification equipment, and water dispensing piping connecting the outlet passage from the water purification system to the gooseneck water dispensing pipe.

4,571,954

WAVEGUIDE PHASE CONJUGATE MIRROR

Thomas G. Roberts, Huntsville, and Thomas E. Honeycutt, Somerville, both of Ala., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Dec. 4, 1984, Ser. No. 677,949
Int. Cl.[4] F25B *19/00*
U.S. Cl. 62—514 R 14 Claims



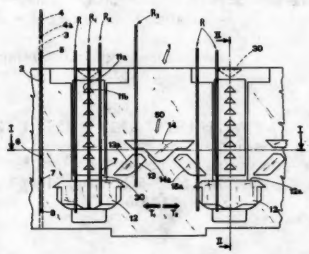
1. A waveguide phase conjugate mirror for 10.6 μm laser light comprising: a cylindrical column of liquid nitrogen having respective first and second ends, said first end disposed for receiving impinging 10.6 μm radiation, and a gaseous nitrogen column cladding the liquid nitrogen around the circumference and along the length thereof for preventing light waves from exiting the liquid nitrogen around the circumference thereof.

4,571,955

AUTOMATIC STRAIGHT KNITTING MACHINE

Benito Stoppazzini, Sala Bolognese, Italy, assignor to E.M.M. Emiliana Macchine Maglierie s.r.l., Bologna, Italy

Filed Mar. 8, 1985, Ser. No. 709,709
Claims priority, application Italy, Mar. 19, 1984, 3386 A/84; Jun. 29, 1984, 3506 A/84
Int. Cl.[4] D04B *7/00*
U.S. Cl. 66—75.1 11 Claims



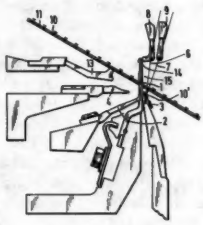
1. Improved automatic straight knitting machine, of the type comprising, among other things, at least one flat longitudinal needle bed provided with transverse equidistantly made slits, in each of which is inserted, commencing at the top and working downwards, a needle with the corresponding blade element, the latter provided with at least two butts, namely a first butt and a second butt, that project from the front side of the needle bed, a carriage being connected to this, able to reciprocate longitudinally, in turn comprising: firstly, selector elements, symmetrical with respect to a vertical transverse plane and movable between two positions, that is to say, a non-operative position and an operative position, the latter for intercepting the first butt of a corresponding blade element, with the consequent raising of this from a neutral position to a first intermediate position; secondly, means destined to raise the said blade element from the first intermediate position to a second intermediate position; thirdly, means for intercepting the said second butt in order, first of all, to raise the said blade element from the second intermediate position to a maximum elevated position, with the corresponding needle sent into operation, and then to lower the said blade element down to the said neutral position; wherein the said means for raising the said blade element from the first intermediate position to the second intermediate position comprise, on each blade element, a third butt oriented in like fashion to the butts, positioned beneath the second butt and connected thereto through a tailpiece restrained to elastic means such as permit the said tailpiece to undergo oscillantions over the transverse plane of the slit in which the said blade element is received; the said raising means also comprising an operating cam, integral with the carriage, that exerts an effect on the said third butt in order to uplift the corresponding blade element from the said first intermediate position to the said second intermediate position solely when the said blade element is in the said first position, or in order to guide the said third butt, and thus the corresponding blade element, into the said neutral position or into a position in between this and the first intermediate position.

4,571,956

WARP KNITTING MACHINE WITH WEFT THREAD MAGAZINE

Hans Fiedler, Obertshausen, Fed. Rep. of Germany, assignor to Karl Mayer Textilmaschinenfabrik GmbH, Fed. Rep. of Germany

Filed Jul. 3, 1985, Ser. No. 752,293
Claims priority, application Fed. Rep. of Germany, Jul. 7, 1984, 3425085
Int. Cl.[4] D04B *23/06*
U.S. Cl. 66—84 A 9 Claims



1. A warp knitting machine for producing knitted ware from warp and weft threads, comprising:

a plurality of needles each having an outtake side and each mounted to reciprocate between an upper and lower dead point;

a plurality of warp thread guides mounted to swing with respect to said needles, a predetermined number of said guides being positioned innermost;

a weft thread magazine for forwarding said weft threads toward said needles with a substantial horizontal vector component near said warp thread guides, said weft thread magazine further comprising:

weft thread insertors for bringing said weft threads across said needles to their outtake side when said needles are moving downwardly, said insertors being operable to place said weft threads in an inlay space bounded, when said needles are at said upper dead point, by said outtake side of said needles and those warp threads running from said innermost ones of said thread guides, said innermost ones of said thread guides having an inwardly directed protrusion which, during the backward swing of said thread guides during said upper dead point of said needles, substantially closes off said inlay space.

4,571,957

DEVICE FOR COMPENSATING FOR DIFFERENCES IN THERMAL EXPANSION IN CIRCULAR KNITTING MACHINES

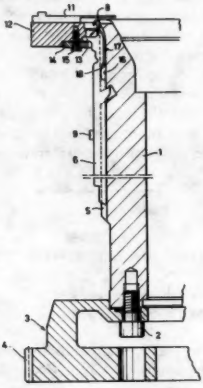
Werner Engelfried, Sindelfingen, and Gerhard Mueller, Esslingen, both of Fed. Rep. of Germany, assignors to Terrot Strickmaschinen GmbH, Stuttgart, Fed. Rep. of Germany

Filed May 1, 1984, Ser. No. 605,767

Claims priority, application Fed. Rep. of Germany, May 5, 1983, 3316382

Int. Cl.[4] D04B *15/00*

U.S. Cl. 66—115 **11 Claims**



1. A circular knitting machine comprising a needle cylinder 1, axially parallel grooves 5 in said needle cylinder, webs (6, 7) arranged in said grooves (5), needles (8) displaceable between said webs (6, 7), projections (13) projecting radially outwards from said webs (6), a sinker ring (12) supported on said projections (13), means (14, 15) for securing said sinker ring (12) on said projections (13) and sinkers (11) guided in said sinker ringer (12) for sliding displacement, characterized in that free spaces (18; 21, 22; 24; 25, 26; 27; 28) are provided between needle cylinder (1) and sinker ring (12) on a level with the projections (13) supporting said sinker ring (12) to allow radial movement of needle cylinder (1) and sinker ring (12) relative to one another at the level of said projections (13) so that differences in the thermal expansion of needle cylinder (1) and sinker ring (12) may be compensated at the level of said projections (13) without mechanical stresses occurring between needle cylinder (1) and sinker ring (12).

4,571,958

YARN FEEDER FOR CIRCULAR KNITTING MACHINE EQUIPPED WITH STRIPERS

José M. Dalmau Güell, Barcelona, Spain, assignor to Jumberca, S.A., Badalona, Spain

Filed Oct. 2, 1984, Ser. No. 656,854

Claims priority, application Spain, Oct. 7, 1983, 526.626

Int. Cl.[4] D04B *15/48*

U.S. Cl. 66—132 R **7 Claims**

1. A yarn feeder for a circular knitting machine, comprising:

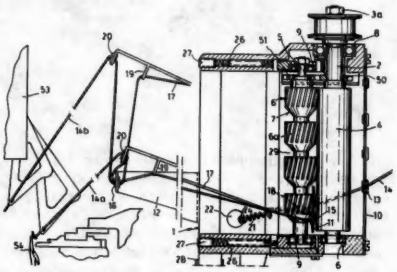
(a) a fixed frame carrying two mutually parallel rotatable shafts, one being a primary shaft and being provided with a smooth cylindrical roller and a drive pulley and the other being a secondary one, carrying equidistant partly tapering and partly cylindrical drive rollers, the cylindrical portion of which engages said cylindrical roller;

(b) operating spaces between the cylindrical roller and each of the driven rollers in which a moving yarn may pass;

(c) a plurality of inlet eyelets receiving the yarns from a creel and disposed on a sloping support attached to the frame on the outside of the circular knitting machine;

(d) a plurality of intermediate eyelets receiving the yarns from the rollers, disposed on a support attached to the frame;

(e) a plurality of arms pivoting around an axis contained respectively on the median planes of the tapered portion of the driven rollers, mounted on the fixed frame and being provided at one end thereof with a yarnguide eyelet for the yarn fed by the inlet eyelets to the rollers, whereas at the other end they are each provided with a ring receiving the yarn from the intermediate eyelets and with a terminal eyelet from whence the yarn moves to needles, said eyelet being adapted, by the pivoting of the corresponding arm for assuming a position in which the yarn between said eyelet and the intermediate eyelet is trapped between the cylindrical roller and a cylindrical portion of the driven roller and consequently said yarn is fed by said rollers;



(f) a plurality of change of direction eyelets mounted on a horizontal curved support attached to the frame on the inside of the circular knitting machine, located in such a way that the sum of the distances from each of them to the ring and to the terminal eyelet of the corresponding arm, at the same angle of pivoting, is the same for all of them;

(g) springs urging the arms in the sense of keeping the yarn always under tension; and

(h) adjusting means for the pivoting arm springs.

4,571,959

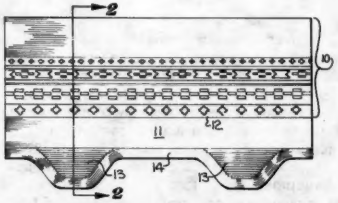
KNIT CAP WITH INTEGRALLY KNIT EARFLAPS

Robert E. Chesebro, Jr., and Philip C. Aigner, both of Sheboygan, Wis., assignors to Wigwam Mills, Inc., Sheboygan, Wis.

Filed Jun. 6, 1985, Ser. No. 741,962

Int. Cl.[4] D04B *1/00*

U.S. Cl. 66—169 R **18 Claims**



1. A knit cap including an upper closed crown portion, a lower band integrally knit with the lower edge portion of said crown, said lower band adapted to extend around the head and above the ears and across the forehead of the wearer, fashioned earflaps integrally knit with and extending downwardly below

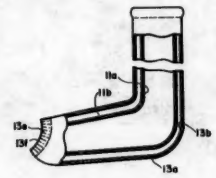
opposite side portions of the lower edge portion of said lower band, and a selvage band integrally knit with the lower edge portion of said lower band and said earflaps and extending around the lower open end of said cap, wherein said crown, said lower band, and said selvage band each comprises successive complete courses of stitch loops extending around said cap and defining adjacent wales extending throughout the length of said cap, said earflaps each comprising successive partial courses gradually increasing in length from said selvage band to said lower band.

4,571,960

TWO-PLY ATHLETIC SOCK WITH LOW-FRICTION INTERFACE SURFACES

David F. Hursh, Lahaska, Pa., and Anthony de Irureta-Goyena, Burlington, N.C., assignors to Foster-Boyd, Inc., Lahaska, Pa.

Filed Sep. 30, 1982, Ser. No. 431,766
Int. Cl.⁴ D04B *7/04*
U.S. Cl. 66—196 **1 Claim**



1. A knitted sock comprising:

(a) an outer layer having a cuff portion, a lower leg portion and a foot portion, said foot portion having an outer shoe-engageable surface comprised of a plurality of hydrophilic, substantially untwisted yarns around which a yarn of hydrophobic material is spirally wound, and also having an inner interfacing surface comprising a plurality of yarns having frictional characteristics substantially lower than said outer surface of said outer ply and being made of generally hydrophobic textile material, and

(b) an inner layer with an outside surface interfacing with said inner surface of said outer layer and comprising a plurality of yarns which have frictional characteristics substantially lower than said inner surface of said inner ply and are generally hydrophobic and an inner foot-engageable surface comprised of a plurality of substantially untwisted hydrophilic yarns around which a yarn of hydrophobic material yarn is spirally wound.

4,571,961

CLAMPING DEVICE

Johann Berger, Obere Schloss-Strasse 114, D-7071 Alfdorf, and Josef Berger, Hainstrasse 11, D-7070 Schwaebisch Gmuend - Grossdeinbach, both of Fed. Rep. of Germany

Filed May 24, 1985, Ser. No. 737,457
Claims priority, application Fed. Rep. of Germany, Jun. 2, 1984, 3420693
Int. Cl.⁴ D04B *23/00*
U.S. Cl. 66—208 **5 Claims**

1. A clamping device for attaching crochet needles to the needle bar of a galloon crochet machine or Raschel loom, with the following features:

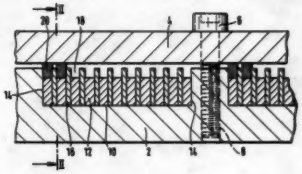
(a) The clamping device comprises two body pieces which may be fastened together by clamping means and one of which is adapted to be fastened to the needle bar;

(b) One of the body pieces serves as a means for receiving the needle shafts;

(c) The device includes spacers adapted to be inserted between the needle shafts,

characterised by the following features:

(d) One of the body pieces has receptacles, each for one group of needles;



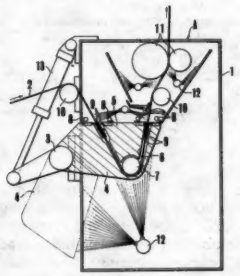
(e) Support pieces having the thickness of the needle shafts are provided for insertion between the individual spacers, and between the floors of the receptacles and the needle shafts.

4,571,962

APPARATUS FOR CONTINUOUS LIQUID TREATMENT OF A CLOTH

Yoshikazu Sando, and Hiroshi Ishidoshiro, both of Wakayama, Japan, assignors to Sando Iron Works Co., Ltd., Japan

Filed Jun. 13, 1984, Ser. No. 620,106
Claims priority, application Japan, Jun. 16, 1983, 58-108364
Int. Cl.⁴ D06B *3/12*
U.S. Cl. 68—5 E **1 Claim**



1. An apparatus for continuous liquid treatment of a cloth comprising a steamer body including a cloth inlet, a treating solution soaking tank (A) provided at a position adjacent to the cloth inlet of said steamer body (B), through which a cloth **2** to be treated is continuously transported for wet-heat treatment, said treating solution soaking tank (A) including:

a fixed tank **5** fitted with a cloth guide roll **7**;

a movable tank **4** having a wall surface adjacent to the wall surface of the fixed tank **5** for forming a cloth passage **6** of the cloth to be treated therebetween;

a cylinder **13** for turning the movable tank **4**;

treating solution supply pipes **8** for supplying a treating solution successively to the cloth passage **6**; and

washing showers **12** for jetting washing water to the cloth passage **6**.

4,571,963

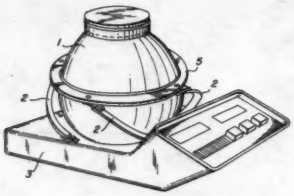
MATERIAL TREATMENT APPARATUS

Cyril J. Williams, 23 Borrow St., Freeling, State of South Australia, Australia

Filed Jul. 26, 1984, Ser. No. 634,708
Int. Cl.⁴ D06F *27/00*; B01F *11/00*
U.S. Cl. 68—171 **9 Claims**

1. Material treatment apparatus, said apparatus comprising a bowl or container, characterized by means to impart to the bowl or container an oscillatory vertical motion, and resilient

means suspending the bowl or container such that the oscillatory motion is converted into a combined part rotary and vertical oscillatory motion by the suspension means, said



means to impart the oscillatory vertical motion comprising an electromagnet mounted on a base supporting the bowl or container, the moveable core of the electromagnet being attached to the bottom of the bowl or container.

4,571,964

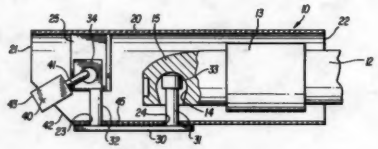
TRAILER HITCH LOCK

William R. Bratzler, P.O. Box 338, Palisade, Colo. 81526

Filed Sep. 25, 1984, Ser. No. 654,347

Int. Cl.[4] E05B *73/00*

U.S. Cl. 70—58 **14 Claims**



1. A locking apparatus for securing trailer hitches having ball receiving socket portions comprising an elongated housing having wall portions and front and rear open end portions, a bracket means mounted within said housing adjacent said front end portion, a locking bar means having a base portion and first and second upwardly extending members, said first and second upwardly extending members being moveably disposed through said wall portions of said housing, means for securing said second upwardly extending member to said bracket member within said housing and said first upwarding extending member being disposed within the socket of the trailer hitch when said housing is placed over the ball receiving socket portion thereof and said second upwardly extending member is secured to said bracket member.

4,571,965

BICYCLE LOCK

Paul LeRoux, 2120 Timberlane, Wheaton, Ill. 60187

Continuation-in-part of Ser. No. 528,217, Aug. 31, 1983, abandoned, which is a continuation-in-part of Ser. No. 460,545, Jan. 24, 1983, abandoned. This application Jan. 11, 1984, Ser. No. 569,788

Int. Cl.[4] B62H *5/16*

U.S. Cl. 70—227 **2 Claims**

1. A bicycle lock for attachment about a bicycle frame member and wheel and comprising:

a rigid metal case having locking openings located therein and extending only partially therethrough;

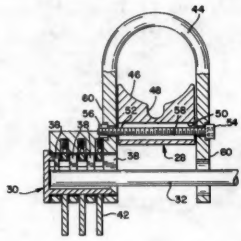
a shackle with leg means extending from an end and adapted to fit into said locking openings, said shackle including tapered ends adapted to guide the legs of the shackle into a storage means, said legs being spaced apart a first distance whereby the legs of the shackle are urged apart when urged into contoured cutouts of the storage means to provide a spring force with the legs of the shackle gripping the contoured cutouts to hold the shackle securely in a stored position;

said case having an internal chamber with lock cylinder means located therein and having a lock bolt for engaging and holding said shackle, said lock cylinder means comprising a modular unit assembled as a unit into the chamber of the lock case and providing said lock bolt to engage the shackle when the shackle leg means are inserted into the locking openings;

saddle means extending outwardly of said case and having a contour to fit about the frame member and including spacing means for locating the lock cylinder away from the bicycle frame member to allow the lock cylinder to be accessible for unlocking the lock;

clamp means for securing the lock to said frame member;

restraining ears for retaining the clamp means on the saddle means;



said storage means including the contoured cutouts extending along each side of said saddle means and being spaced apart a second distance which is greater than the first distance of said spaced apart legs for receiving the shackle and holding it securely when not in use to lock the bicycle, with said storage means being in alignment with the locking openings to locate the leg means of the shackle in proximity with the locking openings thereby covering the openings to prevent contaminants from entering the openings when the shackle is in the stored position;

said case and the leg means and end of the shackle forming an enclosure encircling the associated frame member and adjacent wheel to prevent movement and removal of the wheel when the leg means are inserted into the locking openings.

4,571,966

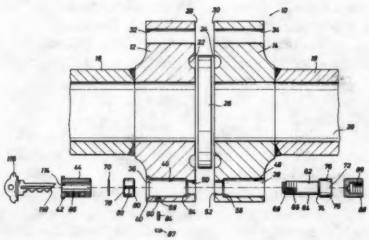
SECURITY MECHANISM FOR PIPE FLANGES

John D. Lopez, Jr., Rte. 3 Box 204, Carthage, Tex. 75633

Filed Apr. 11, 1983, Ser. No. 483,727

Int. Cl.[4] F16B *41/00*

U.S. Cl. 70—232 **17 Claims**



1. A security mechanism for retaining mechanical objects in assembly and permitting separation thereof only by authorized personnel, comprising:

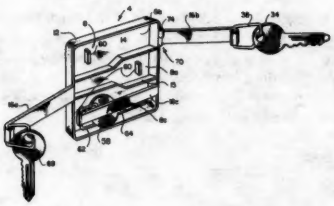
(a) a pair of mechanical objects disposed adjacent one another and being formed to define registering locking receptacles;
(b) a retaining pin having first security means at one end and being threaded at the opposite end, said retaining pin being positioned in completely enclosed relation within said one of said locking receptacles and having a portion thereof extending from said one of said locking receptacles into the other of said locking receptacles;
(c) a retaining sleeve being positioned in completely enclosed relation within said other of said locking receptacles and being threadedly received by said retaining pin, said retaining sleeve defining second security means, said first and second security means preventing assembly and disassembly of said retaining pin and retaining sleeve by means of conventional tools; and
(d) means closing said locking receptacles and permitting access to said retaining pin and retaining sleeve only by authorized persons possessing access tool means of proprietary form enabling removal of said closing means.

4,571,967

KEY HOLDER

Stephen C. Jacobsen, Salt Lake City, Utah, assignor to Jacobson Research Corporation, Salt Lake City, Utah

Filed Mar. 7, 1983, Ser. No. 473,138
Int. Cl.[4] A44B *15/00*
U.S. Cl. 70—456 R **6 Claims**



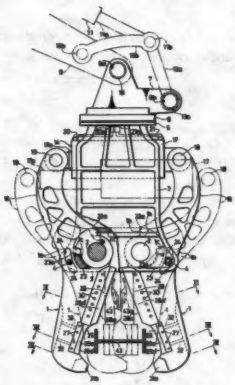
1. A key holder for holding keys comprising
a base having at least one generally flat surface whose length is substantially the same as or greater than the length of the keys to be held,
a plurality of arms, each of whose length is about the same as or greater than the length of the keys, hingedly attached at one end to a front or rear edge of the base to fold in overlying relationship with the flat surface and generally parallel to one another, the other end of said arms being free, wherein alternate ones of the arms are attached to one side of the base, and the remaining arms are attached to other side of the base,
side walls upstanding from side edges of the base to prevent keys from moving sideways from the base,
one or more divider walls upstanding from the flat surface of the base, arranged generally parallel with the side walls, and spaced from the side walls and from each other about an equal distance for keeping the keys on the different arms separated,
means located at the free end of said arms for coupling the arms to respective keys so that the keys can be folded generally flat against the respective arms between the arms and the flat surface,
said coupling means comprising a ring element attached at one side to the free end of an arm, said ring element formed with a break to allow placement keys on the ring element, and formed with a section which extends generally perpendicular to the plane of the ring element and which is sufficiently long to accomodate positioning a key thereon so that the plane of the key is generally parallel with the plane of the ring element, and
means for releasably latching the free ends of the arms to the base.

4,571,968

STEEL FRAME SHEARING APPARATUS

Samon Kanno; Naotomo Kaneko, and Takaharu Kozaki, all of Tokyo, Japan, assignors to Sango Jyuki Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 5, 1984, Ser. No. 647,581
Claims priority, application Japan, Sep. 5, 1983, 58-163082
Int. Cl.[4] B21D *31/02*
U.S. Cl. 72—331 **4 Claims**



1. A steel frame shearing apparatus, comprising: a pair of opposing side plates (3), a pair of jaw members (1) individually pivoted to a pair of main shafts (2) disposed between said side plates, a drive mechanism (14) for causing at least one of said jaw members to perform opening and closing movements, a pair of crushing blades (25) individually mounted on outermost portions of said jaw members in opposing relationship for locally pinching and crushing a workpiece (43) positioned between said blades in response to the closing movement of said jaw member, and a pair of shearing blades (28) individually mounted on innermost portions of said jaw members in opposing relationship for shearing off a pinched and crushed portion of a workpiece in response to the closing movement of said jaw member.

4,571,969

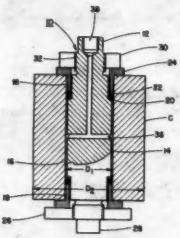
AUTOFRETTAGE PROCESS

Nobuya Tomita, Fairfield, Ohio, assignor to National Distillers and Chemical Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 288,432, Jul. 30, 1981, Pat. No. 4,417,459. This application Sep. 15, 1983, Ser. No. 532,415
The portion of the term of this patent subsequent to Nov. 29, 2000, has been disclaimed.
Int. Cl.[4] B21D *26/02*
U.S. Cl. 72—56 **33 Claims**

1. A process of subjecting a generally thick-walled, hollow cylindrical member to autofrettage including sealing the inner bore of said cylindrical member, and pressurizing said inner bore; comprising the steps of:
(a) imparting at least one predetermined pressure to the entire length of said inner bore for a period of time; and

(b) cyclically repeating the application of at least the same pressure with each cycle so as to plastically deform the



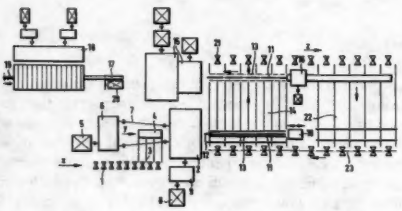
inner bore of said cylindrical member and produce residual tangential compressive stresses in said bore.

4,571,970

ROLLING MILL PLANT FOR THE MANUFACTURE OF SEAMLESS TUBES

Hermann Möltner, Grevenbroich, and Karl-Hans Staat, Homberg, both of Fed. Rep. of Germany, assignors to Kocks Technik GmbH & Co., Hilden, Fed. Rep. of Germany

Continuation of Ser. No. 411,582, Aug. 25, 1982, abandoned.
This application Nov. 16, 1984, Ser. No. 672,116
Claims priority, application Fed. Rep. of Germany, Sep. 14, 1981, 3136381
Int. Cl.[4] B21B *15/00, 19/06;* B21C *45/00*
U.S. Cl. 72—68 17 Claims



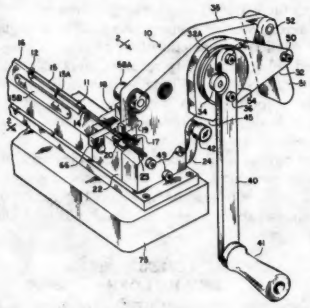
1. A rolling mill plant for the manufacture of seamless tubes, comprising a piercing mill, a shaft rod having a removable piercer at one end and a trailing end at the opposite end, a planetary skew rolling mill and a sizing or stretch-reducing rolling mill are disposed one after the other, and are arranged so that each shaft rod used in the piercing mill is freed from its piercer and remaining in the hollow ingot with the trailing end exposed to serve as a mandrel rod in that ingot for the planetary skew rolling mill, conveying means being provided for returning the shaft rods from the planetary skew rolling mill to the piercing mill after the hollow ingot has been reduced in the planetary skew rolling mill, drive means at the exit end of the planetary skew mill engaging the end of the tube surrounding the shaft rod as they leave the planetary skew rolling mill on a pass line from the planetary skew mill to the stretch reducing mill moving transversely from the pass line and skewing the trailing rod end and surrounding tube end transversely of said pass line from the planetary skew rolling mill to the stretch-reducing mill so that the tube and trailing end of the shaft rod therein are positioned at an angle to the pass line, said drive means engaging said trailing end of the shaft rod and withdrawing the shaft rod from the tube end after said tube end is skewed transversely out of said pass line and the tube positioned at an angle to the pass line, whereby the tube is drawn through the stretch reduction mill free of the shaft rod.

4,571,971

ROD CUTTING AND THREADING MACHINE

Philip Wood, Monte Sereno, Calif., assignor to Phil Wood & Co., San Jose, Calif.

Filed Aug. 6, 1984, Ser. No. 638,260
Int. Cl.[4] B21D *17/00*
U.S. Cl. 72—90 13 Claims



1. A machine for cutting and threading an elongated spoke, comprising:

means to hold the spoke,

a cutting mechanism for severing an end to form said spoke to a desired length,

a threading mechanism to contact and form threads on said spoke,

means to shift said spoke from said cutting mechanism to said threading mechanism, and

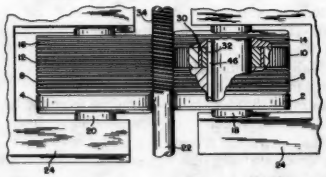
actuating means to actuate said cutting, threading and shift means in a predetermined sequence.

4,571,972

SKEWED-AXIS CYLINDRICAL DIE ROLLING

Howard A. Greis, Holden, and Charles A. Garniewicz, Worcester, both of Mass., assignors to Kinefac Corp., Worcester, Mass.

Filed Feb. 27, 1984, Ser. No. 584,160
Int. Cl.[4] B21H *3/04*
U.S. Cl. 72—98 8 Claims



1. Method of making die roll formed screw threads having gear teeth on certain like areas thereof in a single pass of a workpiece through a multi-element die system comprising:

(1) Die rolling screw threads on the workpiece during rotation and support of the workpiece and performing certain areas thereof to receive the gear teeth,

(2) Die rolling gear teeth on said areas, wherein the gear teeth are formed at the crest of the screw thread,

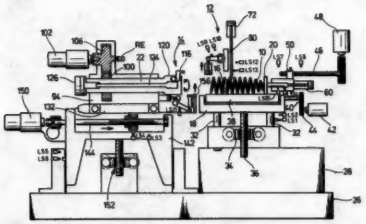
(3) The edges of the gear teeth being roll formed being constrained by a support die to prevent the development of axial burrs.

4,571,973

METHOD AND APPARATUS FOR FORMING A PIG TAIL END ON A COIL SPRING

Motoo Morita, Aichi, Japan, assignor to Morita Iron Works Company, Ltd., Aichi, Japan

Filed Apr. 23, 1984, Ser. No. 603,189
Claims priority, application Japan, Apr. 26, 1983, 58-74592
Int. Cl.[4] B21F *3/10, 35/02*
U.S. Cl. 72—137 22 Claims



1. A method of forming a second pig tail at a second end of a coil spring having a first pig tail at a first end thereof and a cylindrical body portion extending therefrom toward said second end thereof, comprising the steps of:

orienting said coil spring such that its longitudinal axis is disposed horizontally;

providing a support which is angularly pivotable, about an axis disposed parallel to said longitudinal axis of said coil spring, between a first inoperative position and a second operative position;

mounting a winding jig having a spiral stepped portion suited for forming said second pig tail of said coil spring upon said pivotable support;

moving said pivotable support from said first inoperative position to said second operative position so as to dispose said winding jig at a predetermined position within said cylindrical portion of said coil spring;

providing a first clamping means upon said pivotable support for cooperation with said winding jig;

actuating said first clamping means so as to clamp a predetermined portion of said cylindrical portion of said coil spring between said first clamping means and said winding jig and thereby define an initial position from which said second pig tail can be formed;

providing an elevating pedestal for movement within a vertical direction;

providing a bed which is movable upon said elevating pedestal in a horizontal direction parallel to said longitudinal axis of said coil spring;

providing a table which is movable upon said bed in a horizontal direction perpendicular to said directional movement of said bed;

providing a spindle upon said table which is rotatable about an axis disposed parallel to said longitudinal axis of said coil spring;

providing a second clamping means upon said spindle for grasping said second end of said coil spring upon which said second pig tail is to be formed;

actuating said second clamping means so as to clamp said second end of said coil spring; and

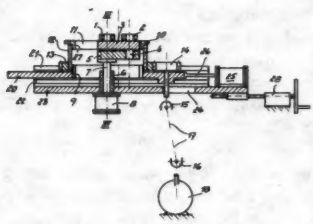
controlling said elevating pedestal, said bed, and said table, for in turn controlling said spindle and said second clamping means in rotational, axial, and radial directions relative to said longitudinal axis of said coil spring, so as to wind said second end of said coil spring about said winding jig and thereby form a second pig tail upon said coil spring.

4,571,974

BENDING MACHINE FOR WIRE OR STRIP MATERIAL

Edgar Pollhammer; Klaus Ritter, and Gerhard Ritter, all of Graz, Austria, assignors to EVG Entwicklungs- u. Verwertungs-Gesellschaft mbH, Graz, Austria

Filed May 14, 1984, Ser. No. 609,738
Claims priority, application Austria, May 18, 1983, 1829/83
Int. Cl.[4] B21D *7/02*
U.S. Cl. 72—217 7 Claims



1. A bending machine for wire or strip material, comprising a baseplate,

two cylindrical bending tools mounted on said baseplate, either of said bending tools being selectable to act as an active bending tool which is pivotable about the position of rest of said other bending tool, said other bending tool then acting as a bending mandrel,

a first bending control-arm supporting said bending tools,

a second control-arm linked to said first control-arm by means of a pivot pin, said pivot pin being aligned with one of said bending tools, said second control arm being pivotably mounted on said baseplate by means of a journal pin disposed parallel to the axis of said pivot pin, the axis of each of said bending tools in the position of rest lying in alignment with the axis of a respective one of said pivot and journal pins, and

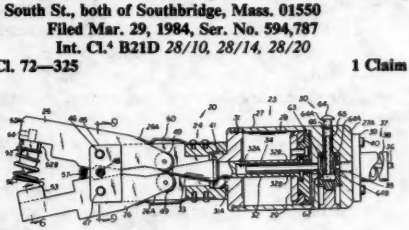
a drive disc rotatably mounted on said baseplate, said drive disc being displaceable by a piston in a straight line within guides between two operative positions in each of which the center of rotation of said drive disc coincides with the axis of one of said bending tools in order to change the bending direction, said drive disc having a diametrical guide which is coupled with said first control-arm supporting said bending tools for transmission of torque to said bending tools.

4,571,975

FLUID ACTUATED TOOL

James A. Pawloski, 189 Durfee St., and Grahame F. Williams, 801 South St., both of Southbridge, Mass. 01550

Filed Mar. 29, 1984, Ser. No. 594,787
Int. Cl.[4] B21D *28/10, 28/14, 28/20*
U.S. Cl. 72—325 1 Claim



1. A fluid activated tool for securing together sheet metal parts comprising

a fluid actuated power pack,

said power pack comprising a cylinder housing having an end wall and defining a piston chamber, said chamber having an open end portion,

a closure for sealing said open end,
a piston reciprocally mounted in said chamber,
a piston rod connected at one end to said piston, said piston rod extending through an opening in said closure, and said piston rod having a bore extending longitudinally thereof,
a port opening communicating said bore with the interior of said chamber,
said port opening being disposed adjacent said piston,
a ram having an inclined surface connected to the other end of said pisto rod,
means defining a fluid inlet formed in said end wall,
a valve means disposed in said end wall for controlling the flow of actuating fluid into and out of said chamber,
said valve member including a valve body having a plurality port means,
and a spool valve disposed in said valve body for sequentially valving said port means for controlling the flow of activating fluid on one side of said piston while exhausting the fluid on the other side of said piston,
and a guide tube connecting said valve body in communication with said bore, said piston rod being in sliding communication with said guide tube,
a jaw housing connected to said closure for receiving said ram,
said jaw housing having a bifurcated end portion,
and a pair of complementary jaw members each having an inner and outer end,
a mounting plate, said pair of jaw members being each pivotally connected to said mounting plate at an intermediate point about an axis;
and said mounting plate being secured to said bifurcated end portion,
spring means for normally biasing said complementary jaw members in an open position,
a cam follower connected to the inner end of each jaw member disposed adjacent said ram,
and complementary work engaging means connected to the outer end of said jaw members, said work engaging means including a piercing nose connected to one jaw member,
said piercing nose having opposed inclined edges and opposed parallel planar surfaces to define a flat pointed blade so that said blade is substantially rectangular in cross-section,
one of said inclined edges being variably angled relative to the other edge, said flat pointed blade being arranged on said outer end of said jaw with the opposed parallel surfaces extending transverse to said axis about which said jaws pivot,
and a complementary blade receiving portion connected to the other jaw member,
said receiving portion defining a flat blade shot adapted to receive said blade when said jaw members are activated by said ram to a closed position to effect cutting and curling of the displaced material to define a positive mechanical connection,
a coil spring means disposed about said flat blade and interposed between said blade and said blade slot for exerting a spring bias between said jaw members subsequent to a securing operation,
and a handle means connected to the end wall of said cylinder housing.

4,571,976

BLIND RIVETING APPARATUS FOR RIVETS OF DIFFERENT SIZES

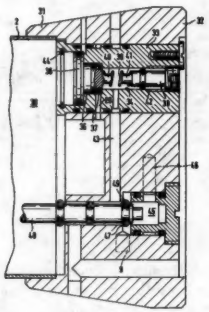
Manfred F. Schwab, Wiesbaden, Fed. Rep. of Germany, assignor to Alfred Honsel Nieten- und Metallwarenfabrik GmbH & Co., Froendenberg, Fed. Rep. of Germany

Filed Mar. 6, 1984, Ser. No. 585,493

Claims priority, application Fed. Rep. of Germany, Jan. 13, 1984, 3400942

Int. Cl.[4] B21D *9/05*

U.S. Cl. 72—391 **14 Claims**



1. A blind riveting apparatus for rivets of different sizes, having a compressed air feed means and an actuating means which is controllable by the compressed air, and a rotary drive motor, characterised in that the actuating means comprises a screw threaded pin (**4**) which is rotated by the drive motor (**7**) for screwing on a threaded rivet nut and an actuating member (**5**) applies axial movement to said pin (**4**) to upset a rivet and the motor is rotated in the opposite direction for unscrewing the rivet nut and air feed means (**9**) directs air to an inlet (**6**) and that disposed at the inlet (**6**) into the blind riveting apparatus (**1**) is a setting means (**10**) for setting the level of the pressure of the compressed air which flows into the apparatus (**1**) and in that the setting means (**10**) passes air to the drive motor (**7**) of the apparatus (**1**), at the pressure of the air from the compressed air feed means (**9**), and reduces the pressure to the motor (**7**) when the riveting operation is concluded.

4,571,977

METHOD OF FORGING FLANGED SHAFT

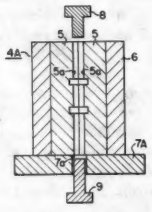
Keii Ueno, Tokyo; Masanobu Ueda, Yokohama; Minoru Tanikawa, Shimizu, and Masami Suzuki, Shizuoka, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 21, 1982, Ser. No. 420,892

Claims priority, application Japan, Sep. 22, 1981, 56-148685; Dec. 8, 1981, 56-196315; Jan. 20, 1982, 57-6045

Int. Cl.[4] B21D *37/16, 22/00*

U.S. Cl. 72—342 **6 Claims**



3. A forging method for producing a flanged shaft provided at an intermediate portion thereof with two flanges, the

method comprising the steps of: preparing a closed die means defining therein a die cavity of a configuration substantially conforming with the flanges and shaft of said flanged shaft;

inserting a blank into said closed die means, said blank having a diameter smaller than the diameter of the shaft but large enough to avoid buckling when compressed in an axial direction;

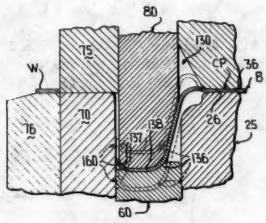
compressing said blank in an axial direction to thereby produce said flanged shaft, and wherein the axial compression of said blank is made only from the upper side of said blank to produce a first flange and, after suspending an application of compression, said die means holding the half-finished blank therein is turned upside down and, subsequently, the compression is applied to said blank again to produce a second flange to thereby produce a flanged shaft having two flanges.

4,571,978

METHOD OF AND APPARATUS FOR FORMING A REINFORCED CAN END

William L. Taube, Murrietta, Calif., and David A. Roberts, Wokingham, England, assignors to Metal Box p.l.c., Wantage, England

Filed Feb. 14, 1984, Ser. No. 579,977
Int. Cl.[4] B21D *22/00, 51/44*
U.S. Cl. 72—349 **37 Claims**



1. A method of forming a reinforced pressure-resistant can end comprising the steps of providing a generally planar metallic blank having a central portion and an outboard peripheral edge portion, exerting first forces against the peripheral edge portion of the blank in a first direction to deform the peripheral edge portion out of the plane of the central portion and shape the blank into a generally flanged cup-shaped configuration defined by the central portion, a radius, a frusto-conical wall and a shallow annular channel-like flange opening in a direction toward the central portion, and exerting second forces greater than the first forces against the flange in a second direction opposite the first direction while gripping the central portion to deform at least a part of the metal of the radius in the absence of restraint out of the plane of the central portion plane, to a side thereof opposite the flange, and in the same direction as the opening direction of the flange; and the first and second directions defining a single reciprocal opposing path of force exertion by the first and second forces.

4,571,979

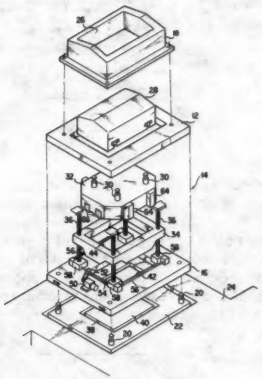
DOUBLE ACTING PRESS FOR SHEET METAL FORMING

Kiyokazu Baba, and Nao-aki Ikeoka, both of Komatsu, Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed Dec. 28, 1984, Ser. No. 687,224
Claims priority, application Japan, Dec. 28, 1983, 58-199407[U]
Int. Cl.[4] B21D *22/00*
U.S. Cl. 72—350 **4 Claims**

1. A double acting press for sheet metal forming, having a hollow blank holder mounted in a substantially fixed relation to a bed, and a punch disposed within the blank holder and moved up and down motion relative to the same by a lower slide, the blank holder coacting with the punch being held in a lowermost position therein for holding thereon a blank to be formed, the blank being formed by being caught between the blank holder and a die forced downwardly by an upper slide and by being pressed against the die by the punch forced upwardly by the lower slide, wherein the improvement comprises:

(a) a floating plate rigidly mounted to the underside of the punch and constrained to joint up and down motion therewith, the lower slide being movable into and out of abutting engagement with the floating plate to cause the up and down motion of the punch relative to the blank holder;



(b) a floating plate rest disposed under the floating plate and movable up and down relative to the bed, the floating plate engaging the floating plate rest and resting thereon when the lower slide is moved downwardly, with the result that the punch on the floating plate is held in the lowermost position within the blank holder as determined by the floating plate rest; and

(c) drive means for adjustably moving the floating plate rest up and down relative to the bed;

(d) whereby the lowermost position of the punch can be adjustably varied by changing the vertical position of the floating plate rest by the drive means in order to hold the punch flush with the blank holder so that the blank to be formed may be placed horizontally on the blank holder and the punch.

4,571,980

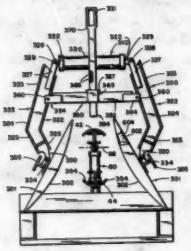
DUCT-SHAPING MACHINE AND METHOD

Ray R. Goodwin, P.O. Box 3607, Omaha, Nebr. 68103

Continuation-in-part of Ser. No. 198,607, Oct. 29, 1980, abandoned. This application Oct. 21, 1983, Ser. No. 436,840
Int. Cl.[4] B21D *51/14*
U.S. Cl. 72—381 **22 Claims**

1. A duct-shaping machine comprising a frame, first and second major-axis duct-shaping modules each having a duct pressing major surface, said modules being elongated and having ends and first and second opposite sides, said major surfaces being spaced apart and facing in opposite directions, a major-axis forcing means on said frame and connected to said modules for forcing said modules to move apart so as to cause said major surfaces to move apart with respect to each other substantially linearly in a first direction, a minor-axis compaction assembly comprising spaced first and second comactors having minor-axis compacting surfaces facing said modules and extending along said first and second sides of said modules,

minor-axis forcing means for forcing said minor-axis compacting surfaces toward said modules, said minor-axis forcing means comprising an arm-holding assembly attached to said frame, a pair of elongated arms extending normally to the elongation of said modules, means pivotally attaching said arms to said holding assembly for the swinging of said arms about respective arm axes which are disposed on opposite sides of a plane extending through the centers of said pressing surfaces and extending along said pressing surfaces, said arm axes



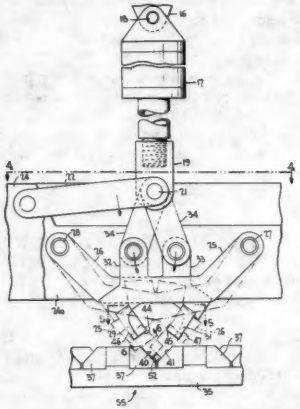
being disposed substantially with their elongation parallel to the elongation of said pressing surfaces, pressure-applying means pivotally connected to the upper ends of said arms for the hinging of the upper ends of said arms on said pressure-applying means about pressure axes each of which are parallel to said arm axes and disposed on the opposite side of said modules from said arm axes, means attaching the lower ends of said arms to those sides of said compactors which are opposite said modules.

4,571,981

SPIKE STRAIGHTENING APPARATUS

John R. Miller, Charlotte, N.C., assignor to Southern Railway Company, Washington, D.C.

Filed Mar. 15, 1984, Ser. No. 590,006
Int. Cl.[4] B21D *3/16*; B21J *7/18*
U.S. Cl. 72—400 **10 Claims**



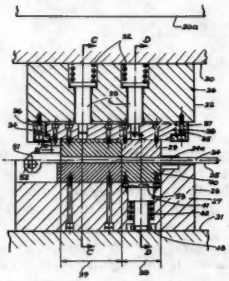
1. An apparatus for straightening an elongated article, such as a rail spike, comprising a frame having a worktable, at least one stationary female die member mounted on said worktable and having a pair of angularly related surfaces for supporting an elongated article to be straightened, said surfaces defining an angular groove, first and second side facing support arms mounted on a portion of said frame at a spaced distance from one side of said worktable respectively for pivotal movement about first and second spaced axes, said female die member lying on said one side of said worktable, said groove opening outwardly of said side, first and second male die blocks respectively mounted on said first and second arms for movement therewith, one of said female die surfaces facing said first male die block, and the other of said female die surfaces facing said second male die block, and means connected to said support arms for simultaneously pivoting said arms about said axes to effect movement of said first and second male die blocks respectively toward and away from said one and said other female die surfaces and respectively along said other and said one female die surfaces whereby to impact against an unstraightened elongated article supported thereon for straightening same wherein only said first male die block, second male die block and angular groove cooperate with one another to straighten said article with only one angular groove in operative relationship with said first and second male die blocks during said article impacting, and said groove opening facing said simultaneous pivoting means.

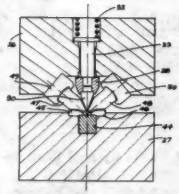
4,571,982

APPARATUS FOR MAKING STEERING RACK BARS

Arthur E. Bishop, 17 Burton St., Mosman, New South Wales; Klaus J. Roeske, 54 Ponyara Rd., Beverley Hills, New South Wales, and David W. Scott, 7 Solitary Pl., Ruse, New South Wales, all of Australia

PCT No. PCT/AU83/00073, § 371 Date Jan. 4, 1984, § 102(e) Date Jan. 4, 1984, PCT Pub. No. WO83/04197, PCT Pub. Date Dec. 8, 1983
PCT Filed Jun. 2, 1983, Ser. No. 572,424
Claims priority, application Australia, Jun. 4, 1982, PF4309
Int. Cl.[4] B21J *7/18*; B21K *1/76, 7/12*
U.S. Cl. 72—400 **8 Claims**





1. A die for forming a Y-form rack portion of a steering rack bar from a blank by forging, the rack section having teeth formed on one face and on the opposite face thereof, at least two longitudinally extending guide faces, the die comprising a group of at least three forming elements movable relatively to each other on application of forging pressure to the die to converge on a blank placed therein, a first of said forming

elements having in it cavities the shape of which correspond to the shapes of the teeth to be formed with the teeth forming cavities extending along a longitudinal axis, second and third forming elements having forming faces extending parallel to said longitudinal axis and adapted to form the said longitudinal guide faces, means for moving said second and third forming elements toward said first forming element for forging with the movement being in a direction transverse to said longitudinal axis, the said three forming elements being shaped and arranged to move relative to each other in such a manner to inhibit escape of the material of the blank between said first and second or first and third forming elements up to substantially the last instant of clore of the die.

4,571,983

REFRACTORY METAL COATED METAL-WORKING DIES

Harold C. Sanborn, Bolton; Frank Carago, South Windsor, and John R. Kreeger, Hebron, all of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Apr. 30, 1985, Ser. No. 728,958
Int. Cl.[4] B05D *1/08*; B21K *5/20*
U.S. Cl. 72—462 **4 Claims**

1. A method for improving the durability of metal-working dies having surfaces with predetermined contours including the steps of:

a. working at least one article to said predetermined contours using said dies;

b. plasma spraying at least a portion of the contoured surfaces with a material selected from the group consisting of molybdenum, columbium, tantalum, tungsten, rhenium, hafnium, and mixtures thereof;

c. reforming the article shaped in step a. in said coated dies to densify said sprayed coating without causing substantial metal flow or shear stresses;

whereby the coated, densified dies exhibit substantially enhanced resistance to wear during use.

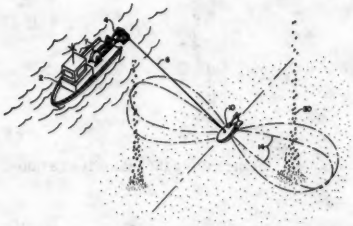
3. A metal-working die having on its surface a compacted plasma sprayed coating of a material selected from the group consisting of molybdenum, columbium, tantalum, tungsten, rhenium, hafnium, and mixtures thereof.

4,571,984

APPARATUS AND METHOD FOR DETECTING GAS BUBBLES IN WATER, AND APPARATUS FOR HANDLING AN OCEANOGRAPHIC DEVICE

Norman D. Malcosky, Columbus, Ohio, assignor to Columbia Gas System Service Corp., Columbus, Ohio

Filed Mar. 14, 1983, Ser. No. 475,591
Int. Cl.[4] G01N *29/02*
U.S. Cl. 73—19 **15 Claims**



1. A side scanning sonar apparatus for detecting gas bubbles in water comprising:

a body at least part of which is submersible in said water;

drive means for moving said body in one direction through said water;

orientation control means for maintaining said body in a predetermined orientation to the vertical; and

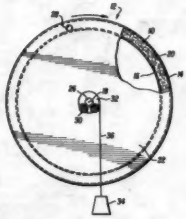
at least one fluid wave energy transducer mounted on a submersible part of said body, said transducer being capable of emitting a beam of low frequency fluid wave energy substantially horizontally and transversely of said direction, said beam having a width of at least about 45° in a horizontal plane, said transducer also being capable of detecting low frequency fluid wave energy impinging thereon.

4,571,985

METHOD AND APPARATUS FOR MEASURING THE HYDRAULIC CONDUCTIVITY OF POROUS MATERIALS

Charles J. Daly, Denver, Colo., assignor to The United States Army Corps of Engineers as represented by the Secretary of the Army, Washington, D.C.

Filed Nov. 17, 1983, Ser. No. 552,883
Int. Cl.[4] G01N *15/08*
U.S. Cl. 73—38 **20 Claims**



11. Apparatus for measuring a quantity directly related to hydraulic conductivity of a porous material, comprising

a. at least two concentric cylinders of substantially equal length defining at least one annular chamber therebetween;

b. means for sealing said at least one annular chamber, at least a portion of said at least one annular chamber containing a partially saturated sample of a porous material;

c. means for mounting said at least two concentric cylinders for rotation about an axis thereof;

d. means carried by the mounting means for establishing a dynamic equilibrium of said at least two concentric cylinders; and

e. means for measuring the rate of rotation of said at least two concentric cylinders under dynamic equilibrium, the rate of rotation being directly related to the hydraulic conductivity of said sample.

4,571,986

PIPE LEAK DETECTOR

Noritsugu Fujii, and Toshimitsu Nishimura, both of Yamaguchi, Japan, assignors to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan

Filed Oct. 11, 1983, Ser. No. 540,619
Claims priority, application Japan, Oct. 12, 1982, 57-154819[U]; Oct. 12, 1982, 57-154820[U]; Mar. 16, 1983, 58-42437
Int. Cl.[4] G01M *3/08*
U.S. Cl. 73—49.1 **1 Claim**

1. A pipe leak detector for detecting leak defects simultaneously in a pair of pipes comprising:

a pipe clamp jig for holding said pair of pipes comprising;

a clamp body internally provided with a cylindrical chamber;

a piston slidably fitted in said cylindrical chamber;

a clamping means for gripping said pipes upon said pipes

insertion into said clamping means and upon the displacement of said piston;

sealing means for hermetically engaged with a fore end of each of said inserted pipes for sealing said inserted pipes;

an air leak hose joint receptacle formed in said clamping means at one end of said cylindrical chamber for providing an air passage for communicating with said inserted pipe;

means for supplying compressed air;

a first on-off valve coupled to said first pipe to be examined;

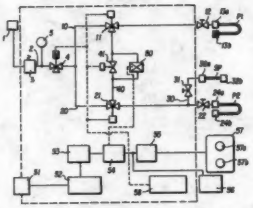
a first electromagnetic valve coupled to said first on-off valve for operating said on-off valve;

a first circuit conduit connected to said first pipe being examined through said first on-off valve;

a second on-off valve coupled to said second pipe to be examined;

a second electromagnetic valve coupled to said second on-off valve for operating said second on-off valve;

a second electromagnetic conduit connected to said second pipe being examined through said second on-off valve;



a main conduit for connecting said first and second circuit conduit to said means for supplying compressed air;

a third circuit conduit for coupling said first and second circuit conduits with each other;

a calibration conduit coupled to either of said first and second circuit conduits and branched therefrom;

a third on-off valve coupled to said calibration conduit;

a reference pipe coupled through said third on-off valve to said calibration conduit;

a third electromagnetic valve inserted in said third circuit conduit;

a pressure transducer connected in parallel with said third electromagnetic valve and for generating output signals;

detector means for producing a leak signal when said outputted signal from said pressure transducer exceeds a predetermined valve; and

means for sealing the compressed air from said means for supplying compressed air to the pipes under examination by way of said pipe clamp jig or to the conduit connected to said reference pipe in response to the opening and closing of said first, second and third electromagnetic valves.

4,571,987

LEAK DETECTOR

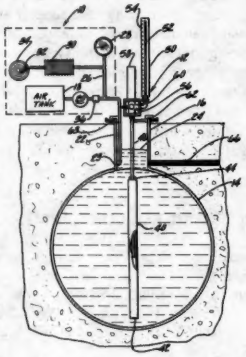
John A. Horner, 211 E. Grove St., Kawkawlin, Mich. 48631

Filed Sep. 21, 1983, Ser. No. 534,310

Int. Cl.[4] G01F *23/14*

U.S. Cl. 73—49.2 **3 Claims**

1. Apparatus for testing liquid storage tanks having inlet ports for leakage comprising: a tubular probe adapted to contain a measuring liquid having a coefficient of explansion equal to the liquid in the tank being tested, means for securing said probe in a stationary vertical position relative to said inlet port and within the liquid in the tank to be tested, a graduated sight tube having liquid communication with said probe and being positioned about the level of the liquid in said tank whereby changes of liquid volume that occur in said probe in response to changes in a liquid temperature are apparent at said sight tube, a liquid chamber adjacent to said sight tube, and valve means movable between a position placing said chamber, said sight tube and said probe in communication with each other for



filling with said measuring liquid and another position isolating said chamber, and means for measuring changes in liquid levels simultaneously with the measurement of changes in temperature.

4,571,988

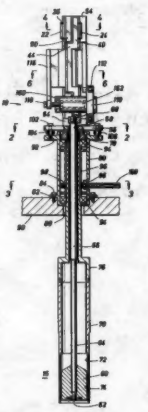
APPARATUS AND METHOD FOR MEASURING VISCOSITY

Robert J. Murphy, Jr., Bellaire, Tex., assignor to NL Industries, Inc., New York, N.Y.

Filed Jul. 16, 1984, Ser. No. 631,237

Int. Cl.[4] G01N *11/14*

U.S. Cl. 73—60 **14 Claims**



1. An apparatus useful for measuring the viscosity of a liquid, comprising:

a stationary frame;

a tubular sleeve;

means for suspending said tubular sleeve from said stationary frame;

means for rotating said sleeve;

a cylindrical bob suspended along its axis in said sleeve, said bob capable of limited angular motion about the axis of said sleeve, the radius of said cylindrical bob approximat-

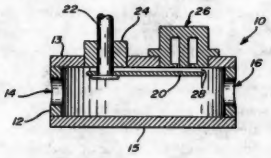
ing but being less than the interior radius of said sleeve near said bob;
a movable frame suspending said bob within said sleeve, said movable frame capable of limited angular motion in response to the motion of said bob;
a flexural bearing suspending said movable frame from said stationary frame;
means for positioning said bob and said sleeve so that said bob and the portion of said sleeve near said bob are capable of being immersed in said liquid; and
means for measuring the motion of said movable frame relative to said stationary frame.

4,571,989

METHOD AND APPARATUS FOR MEASURING RHEOLOGICAL PROPERTIES OF FLUID

John M. Dealy, 305 Grosvenor Ave., Montreal, Canada (H3Z 2M1)

Filed Oct. 16, 1984, Ser. No. 661,319
Int. Cl.[4] G01N *11/00*
U.S. Cl. 73—60 **10 Claims**



1. An apparatus for measuring rheological properties of a fluid comprising a fluid channel having a wall at least partially defining the channel, a plate mounted in said fluid channel, said plate having a surface substantially parallel to at least a portion of said wall, means for moving the plate such that the plate surface moves with respect to the wall to thereby subject fluid between the wall and surface to a shearing deformation, a shear stress transducer mounted in said wall where said fluid is subjected to said shearing deformation, said transducer having a member adapted to measure the tangential force exerted thereon by said fluid

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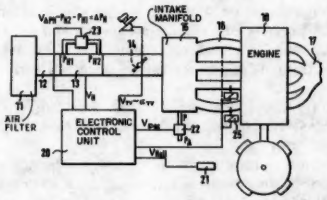
4,571,990

METHOD AND APPARATUS FOR MEASURING THE RATE OF AIR FLOW IN THE INTAKE TUBE OF AN INTERNAL COMBUSTION ENGINE

Günter Hönig, Ditzingen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Feb. 10, 1984, Ser. No. 578,866
Claims priority, application Fed. Rep. of Germany, Feb. 11, 1983, 3304710
Int. Cl.[4] G01M *15/00*
U.S. Cl. 73—118 **14 Claims**



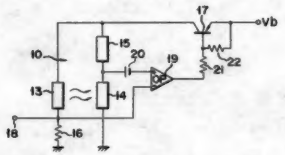
1. Method for measuring the rate of air flow in an intake tube of an internal combustion engine wherein both forward and reverse flows of air occur, the engine being equipped with a measuring device such as a hot-wire sensor, hot-film sensor or the like for measuring the flow of air irrespective of the direction thereof and for providing a signal indicative of the instantaneous rate of flow, the method comprising the steps of:
evaluating the shape of said signal to detect the actual points of flow reversal; and,
subtracting the quantity of air occurring during reverse flow from the total quantity air flow.

4,571,991

AIR FLOW MEASURING APPARATUS

Tomoaki Abe, Oobu; Masumi Kinugawa, Okazaki, and Atsushi Suzuki, Oobu, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Aug. 29, 1984, Ser. No. 645,393
Claims priority, application Japan, Sep. 2, 1983, 58-161480
Int. Cl.[4] G01M *15/00*
U.S. Cl. 73—118 **7 Claims**



1. An air flow measuring apparatus comprising:
a heater made of resistant material having a positive temperature coefficient and located in an air flow to be measured;
a fixed resistance connected in series to the heater;
a first heat sensitive element made of resistant material having a positive temperature coefficient, located together with the heater in the air flow, and heated by the heater;
a second heat sensitive element made of resistant material having a positive temperature coefficient, connected in series to the first heat sensitive element, and located in the air flow to have a resistant value which corresponds to the temperature of the air;
a current control circuit for supplying a controlled current to a bridge circuit, which comprises a series circuit consisting of the heater and fixed resistance, and a series circuit consisting of the first and second heat sensitive elements;
a voltage comparing means for comparing voltage at the node between the heater and the fixed resistance, which form the bridge circuit, with the one at the node between the first and the second heat sensitive element to control the current control circuit according to the comparison result thus obtained; and
an output means for generating a voltage signal which corresponds to the value of the current flowing to the fixed resistance circuit through the heater.

4,571,992

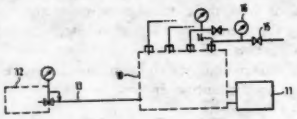
METHOD OF DETERMINATION OF SUPPLY START IN INJECTION PUMPS

Ulrich Kuhn, Renningen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Oct. 28, 1981, Ser. No. 315,992
Claims priority, application Fed. Rep. of Germany, Dec. 13, 1980, 3047078
Int. Cl.[4] G01M *15/00*
U.S. Cl. 73—119 A **8 Claims**

1. A method of determination of a supply start in an injection pump, particularly Diesel injection pump, comprising the steps of blocking an outlet of a pump element; supplying a testing

volume into the pump element; and determining a supply start upon a pressure increase in the pump element when an upper



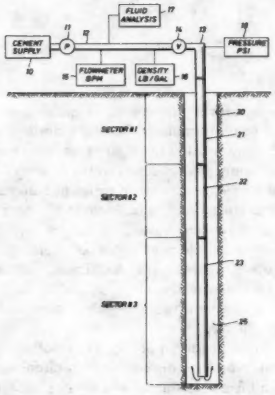
edge of a pump piston closes a fuel inlet opening of the pump element.

4,571,993

CEMENTING SYSTEM INCLUDING REAL TIME DISPLAY

Kenneth J. St. Onge, Marlow, Okla., assignor to Halliburton Company, Duncan, Okla.

Filed Feb. 27, 1984, Ser. No. 583,926
Int. Cl.[4] E21B *47/06*
U.S. Cl. 73—151 **14 Claims**



1. A cementing system cooperative with a cement pumping apparatus including a connective manifold from the pumping apparatus to a well head for cementing the well in the completion thereof and wherein fluid pumped at the wellhead is pumped into a pipe string in the well the string having at least two sections serially joined wherein the sections have different physical characteristics of flow of fluid, the cementing system comprising:

(a) transducer means for measuring parameters of flow to the well from the pumping apparatus including means for determining wellhead pressure, said transducer means being located at the surface and obtaining surface measurements;

(b) data conversion means connected to said transducer means for determining down hole parameters including bottom hole pressure as a function of wellhead pressure from the surface measurement obtained by said transducer means;

(c) output means for providing output data indicative of down hole parameters occurring during the pumping the fluid into the well; and

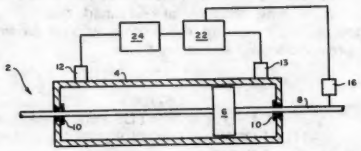
(d) said output means providing a visual display to an operator wherein the visual display sets forth down hole parameters.

4,571,994

ACOUSTICAL TESTING OF HYDRAULIC ACTUATORS

Joseph W. Dickey, and Lloyd E. Powell, both of Annapolis, Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 6, 1984, Ser. No. 638,148
Int. Cl.[4] G01M *3/24*
U.S. Cl. 73—168 **3 Claims**



1. A device for testing a hydraulic actuator, said actuator having a cylinder and a piston and a tailpiece, comprising:

an acoustic transducer in contact with the cylinder wall of said actuator so as to sense any acoustic sources therein, and produce an output;

a position sensor in contact with the tailpiece of said actuator for sensing the position of said tailpiece and the position of the piston of said actuator and producing an output indicative of said position of said piston; and

an X-Y plotter having two inputs connected to the output of said transducer and the output of said sensor and producing an output in the form of a graph showing the relation of acoustic emissions to piston position;

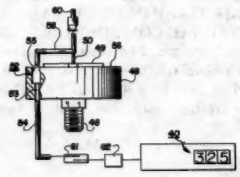
whereby the output of said plotter indicates whether any defects are present in said actuator, the location of said defects and the type of said defects.

4,571,995

DIGITAL READOUT INDICATOR OF OXYGEN USAGE, PRESSURE AND FLOW

William F. Timme, Oradell, N.J., assignor to William S. Adam, Maywood and John J. Walsh, Waldwick, both of, N.J.

Filed Sep. 13, 1984, Ser. No. 650,094
Int. Cl.[4] G01F *13/00*
U.S. Cl. 73—199 **24 Claims**



1. A digital readout and display apparatus indicating at least flow and pressure of gas such as oxygen and the like stored under pressure in a tank or container, said apparatus to the outlet of this tank of gas, this digital readout and display apparatus including:

(a) a rigid and generally elongated housing having inlet means for removably attaching said tank of gas to said rigid housing;

(b) a screw-controlled pressure regulator carried within said rigid housing with said housing adapted to pass absent accidental leakage gas from said tank while providing an outlet for connection of a flexible conduit adapted to carry gas at a determined flow rate and pressure to a user, this rigid housing having at least two outlets with screw thread means for transmitting gas under pressure to an

adjacent associated case in which digital readouts are carried;

(c) a case or container disposed to be positioned adjacent the elongated housing, said case having a face portion in which are carried a plurality of visual-reading digital readout displays, this case having a plurality of inlet means aligned with and adapted to be removably attached to the plurality of screw-thread outlets of said rigid housing, and within this case there is provided a plurality of gauge members, each gauge member having a rigid stem or shaft extending from and substantially normal to an upper surface of a body of said gauge, this extending stem or shaft of a determined length and providing a supporting means;

(d) means for securing on said stem or shaft a light conducting rod or member having a light entry surface portion which in mounted condition is normal to the axis of said shaft, said light conducting rod constructed with an extending portion so as to carry light to an outlet surface a small distance above and parallel to an upper surface of a gauge body for said gauge and from which the rigid shaft extends, said outlet surface near the periphery of said body, and in a secured and mounted position said light conducting rod has its upper entry portion and its discharge end in a non-engaging friction-free condition;

(e) a source of electrical energy contained within said case and means for actuating said energy;

(f) means providing relative motion between the gauge stem and the gauge body;

(g) a light emitter secured to the case and near to and adapted to direct light to the entry end portion of said light conducting rod;

(h) a multiplicity of light sensors carried by the gauge body and arranged in a circular pattern and positioned adjacent the discharge end of the mounted light transmitting rod, and means for actuation of only one-at-a-time of said sensors, the actuation of each of said sensors generating an electrical signal which is sent to a microprocessor energized by the electrical source, and

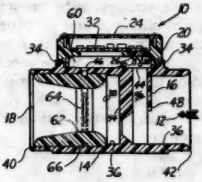
(i) a digital readout display associated with each light conducting rod, said display when energized providing a visual readout easily discerned by the user or attendant.

4,571,996

AIR FLOW SENSOR

Russell J. Wakeman, Newport News; Danny O. Wright, Grafton, and William A. Peterson, Jr., Williamsburg, all of Va., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Filed Aug. 10, 1984, Ser. No. 639,560
Int. Cl.[4] G01F *5/00*
U.S. Cl. 73—202 **10 Claims**



1. An air flow sensor for measuring the rate of air flow, the sensor comprising:

an air flow body having a substantially cylindrical hollow tubular cross section having at least two different internal diameters to exhaust air at a first end and receive air at the other end, said body having a shoulder formed at the junction of said diameters, an input port intermediate said other end and said shoulder and an exhaust port intermediate said shoulder and said first end and axially aligned with said input port;

a cylindrical venturi insert member inserted into said first end of said air flow body and into abutment with said shoulder, said venturi insert member having a ring slot on the outer surface thereof with at least two spaced slots therein extending through the minor diameter of the venturi section for communicating with said exhaust port;

a tubular impact tube extending along a diameter from the inner wall of said air flow body through said input port to the outer surface of said air flow body, said impact tube having a first and second oppositely disposed slots for receiving air flow into said first slot and exhausting air flow from said second slot, said impact tube having an axially extending passageway for diverting air flow from said first slot to a passageway along the axis of said tubular cross section;

an air bypass housing mounted on said air flow body and enclosing said input and exhaust ports providing an air flow bypass chamber therebetween for receiving diverted air from said impact tube and exhausting the diverted air through said exhaust port;

first and second sensors in said air bypass housing and aligned along the axis of said impact tube, said sensor elements located to receive the maximum velocity of the bypass air flowing from said impact tube; and

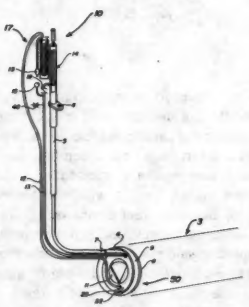
electronic circuit means electrically connected to said sensor elements and operable to generate electrical signals proportional to the rate of air flow through said air flow sensor.

4,571,997

FLOW MEASURING APPARATUS

Larry G. Kepple, Palo Cedro, and Samuel L. Smith, Redding, both of Calif., assignors to Professional Associated Consulting Engineers Incorporated, Redding, Calif.

Filed Jun. 21, 1984, Ser. No. 622,837
Int. Cl.[4] G01F *1/36*
U.S. Cl. 73—215 **13 Claims**



1. A flow sensing device for installation in a conduit, comprising:

a hollow body, consisting of a substantially cylindrical support frame, having a flow path therethrough with an exit end and an inlet end;

an inflatable collar surrounding said support frame so that, when said hollow body is placed in said conduit and said inflatable collar is inflated, a seal is formed between said hollow body and said conduit;

a base weir/orifice plate mounted across said inlet end of said hollow body having an invert level positioned at a predetermined distance from the invert of said conduit;

pressure sensing means mounted on said base weir/orifice plate a predetermined distance below said invert level of said base weir/orifice plate;

a bubbler supply tube connected to said pressure sensing means, and

pressure indicating means attached to said bubbler supply

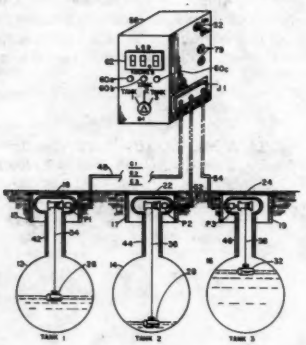
tube whereby pressure at said base weir/orifice plate is measured.

4,571,998

IN-GROUND TANK MEASURING SYSTEM

Kevin Stegner, 21 Wilstand Ave., Patchogue, N.Y. 11772

Filed Jul. 18, 1984, Ser. No. 631,992
Int. Cl.[4] G01F *23/10*; G01D *21/02*
U.S. Cl. 73—321 **4 Claims**



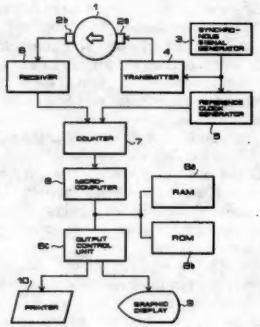
1. A system for monitoring the level of liquid fuel in each of a plurality of underground tanks comprising a float resting on the surface of said liquid fuel in each of said tanks, cable means connected to each float extending vertically upwardly and out of each said tank, and transducer means including biased take-up reel means for the winding thereon of each of said cable means, each said reel means being biased to take up any slack in said cable means, and potentiometer means having a wiper coupled to said reel means for indicating the level of said liquid fuel in each said tank, and monitor means connected by electrical cable means to all of said potentiometer means for displaying in digital form the level of fuel in a selected tank and a warning when a predetermined level is reached in any one of said tanks, said monitor means comprising means to generate a reference voltage and apply same across each of said potentiometer means, means to receive the voltage signals picked off by each wiper, each of said signals being a direct indication of the level of fuel in each of said tanks, switch means to select one of said voltage signals, means for converting the selected voltage signal into the aforesaid digital readout display for indicating directly and virtually instantaneously the level of fuel in the tank whose voltage signal was selected, a separate power source for said converting means, means bypassing said switch means for identifying and producing a warning signal when the level of fuel drops to a predetermined value in any one of said tanks, separate electrical grounds being provided for the reference voltage and said power source to reduce the effects of interference noise on said voltage signals, and means to adjust the reference voltage and means to adjust the tank empty and full level signals for each of the tanks.

4,571,999

ULTRASONIC INSPECTING APPARATUS

Kishio Arita, Tokyo; Susumu Mitani, Saitama; Hideo Sakai, Saitama; Yoshikazu Sudo, Saitama; Yoshitaka Koide, Tokyo; Haruzi Sato, Kanagawa; Yoshio Habuka, Kanagawa; Takashi Kozakai, Kanagawa, and Hiroji Tanaka, Kanagawa, all of Japan, assignors to Nippon Telegraph and Telephone Public Corporation and Mitsubishi Denki Kabushiki Kaisha, both of Tokyo, Japan

Filed Apr. 20, 1984, Ser. No. 602,371
Claims priority, application Japan, Apr. 23, 1983, 58-71995
Int. Cl.[4] G01N *29/04*
U.S. Cl. 73—598 **2 Claims**



1. An ultrasonic inspecting apparatus comprising:

means for measuring propagation time between one point sequentially selected on the outer circumference of a specimen for transmitting an ultrasonic wave directed to the center of the specimen and another point on the outer circumference spaced apart from said selected point by a predetermined angle for receiving the ultrasonic wave;

data processing means for sequentially reading data of the propagation time measured by said measuring means and performing predetermined operations with reference propagation time of the ultrasonic wave measured at a sound portion of the specimen to provide data representing the state of cross-section at a predetermined portion of the specimen; and

means for displaying said data provided from the data processing means in graphical form;

said data processing means including:

(1) means for selecting propagation time of the ultrasonic wave traveling through the diameter of a sound portion of the specimen as a reference propagation time;

(2) means for determining a first ratio between propagation time of an ultrasonic wave traveling through the diameter of the measuring cross-section of the specimen and the reference propagation time at plural points on the circumference of the specimen;

(3) means for substituting the first ratio in a predetermined first calculation formula

$$f=(Ri-100/1.3)\,0.65_D$$

where f=length of the defect, Ri=first ratio, D=diameter of specimen, for determining the length of the defect;

(4) means for determining a second ratio which is derived from the ultrasonic propagation time between the transmitting point of the ultrasonic wave and the receiving point on the outer circumference of the specimen spaced apart from the transmitting point by 90°, and the reference propagation time at plural points on the outer circumference;

(5) means for determining that the portion having the second ratio which is greater than a predetermined reference value has a defect;

(6) means for determining a third ratio which is derived from ultrasonic propagation time between the transmitting point of an ultrasonic wave and the receiving point on the outer circumference of the specimen spaced apart from the transmitting point by a predetermined angle less than 90° and the reference propagation time at plural points on the outer circumference;

(7) means for substituting the third ratio in a predetermined second calculation formula

$$d=70/(R_M ij-28)^{0.55}$$

where d=depth from the outer circumferential surface of the specimen to the defect, $R_M ij$=third ratio, for determining the depth from the outer circumferential surface to the defect;

(8) means for substituting length and depth of the defect in a predetermined third calculation formula

$$r=D/2-(d+f/2)$$

where r=center radius of the defect, for determining the center radius of the defect; and

(9) means for displaying the state of the cross-section including the defect in graphical form on the basis of the center position and the length of the defect.

4,572,000

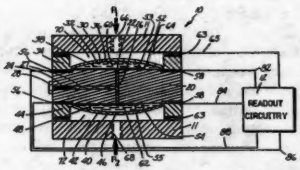
PRESSURE SENSOR WITH A SUBSTANTIALLY FLAT OVERPRESSURE STOP FOR THE MEASURING DIAPHRAGM

Robert R. Kooiman, Eden Prairie, Minn., assignor to Rosemount Inc., Eden Prairie, Minn.

Filed Dec. 9, 1983, Ser. No. 559,894

Int. Cl.⁴ G01L *9/12*

U.S. Cl. 73—718 **14 Claims**



1. A transducer for sensing a magnitude of a first pressure and having a first pressure chamber and a second pressure chamber for sensing at least the magnitude of the first pressure comprising:

a housing;

center stop means on the housing and having a substantially flat first face for providing a portion of the first pressure chamber and a substantially flat second face for providing a portion of the second pressure chamber, respectively.

first sensor diaphragm means open and responsive to said first pressure supported on the center stop means for enclosing, with the first face, the first pressure chamber, said first diaphragm means having a substantially flat surface contacting the flat first face at a substantially unstressed condition;

second sensor diaphragm means supported on the center stop means for enclosing, with the second face, the second pressure chamber;

passageway means provided in the center stop means for fluidically coupling the first pressure chamber to the second pressure chamber such that when the magnitude of a first pressure exceeds a predetermined magnitude the first sensor diaphragm is supported by the first face of the center stop means;

a filling of substantially noncompressible fluid in the passageway means and in both the first and second chambers to bow both the first and second sensing diaphragm means away from the respective first and second faces with substantially equal external pressures on the first and second diaphragm means; and

sensing means for sensing the deflection of at least one of the diaphragm means.

4,572,001

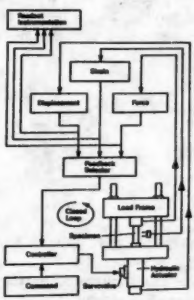
METHOD AND APPARATUS FOR MEASURING THERMODYNAMIC RESPONSE

Shigeo Saimoto, Kingston, and Zbigniew Basinski, Gloucester, both of Canada, assignors to Queen's University at Kingston, Kingston, Canada

Filed Jan. 30, 1984, Ser. No. 575,274

Int. Cl.⁴ G01N *3/00*

U.S. Cl. 73—765 **7 Claims**



1. A method for precisely controlling plastic strain rate change during plastic deformation testing of a solid material specimen, comprising the steps of:

(a) applying plastic strain to said specimen, mounted in a testing frame, at a predetermined controlled displacement rate;

(b) applying an abrupt plastic strain rate change at one or more predetermined strain increments;

(c) measuring the imposed plastic strain rate change;

(d) detecting any net change in elastic response of said testing frame, including said specimen, during testing;

(e) applying an elastic compensating displacement to said testing frame, including said specimen, so that the actual plastic strain rate response of the deforming specimen can be measured; and

(f) measuring any incremental change of stress required for continuous plastic flow of the specimen upon application of said abrupt change in the plastic strain rate.

4,572,002

APPARATUS FOR DETERMINING THE FATIGUE LIMIT OF ELASTIC MATERIAL UNDER COMPLETELY REVERSED STRESS

Volker Härtel, Germering, and Manfred Hofmann, Hünfelden, both of Fed. Rep. of Germany, assignors to Metzeler Kautschuk GmbH, Munich, Fed. Rep. of Germany

Filed Mar. 1, 1984, Ser. No. 585,002

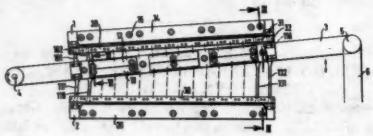
Claims priority, application Fed. Rep. of Germany, Mar. 1, 1983, 3307204

Int. Cl.⁴ G01N *3/32*

U.S. Cl. 73—809 **12 Claims**

1. An apparatus for determining the fatigue limit of rubber materials under completely reversed stress, comprising two stationary clamping beams, a rocker having an end and a fulcrum, each of said stationary clamping beams being disposed on a respective side of said rocker, said rocker being substantially parallel to at least one of said clamping beams in a given

position of said rocker, a crank mechanism connected to said end of said rocker for moving said rocker out of said given position, and means for clamping at least one row of mutually parallel strip-shaped samples of the rubber material between said rocker and said at least one clamping beam, the samples



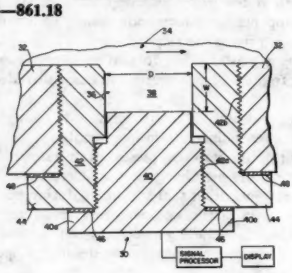
being alternately stretched and relaxed to a different degree depending on the distance thereof from said fulcrum of said rocker by moving said rocker to alternately apply no load and a maximum load to the samples for determining the number of load alternations resulting in breakage of the material.

4,572,003

SIDETONE GENERATOR FLOWMETER

Robert J. Fritz, Schenectady, N.Y., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Nov. 3, 1983, Ser. No. 548,277
Int. Cl.[4] G01F *1/20*
U.S. Cl. 73—861.18 2 Claims



1. A device for measuring the velocity of fluid flow along an enclosed path in a velocity range in which the Strouhal number is constant, said device comprising:

sidetone generator means, comprising a cavity in a wall defining the flow path for the fluid flow, for generating a side tone during the flow of fluid past the cavity in said velocity range in which the Strouhal number is constant, the dimensions of said cavity being such as to produce a dominant vibratory frequency within said cavity;

pressure sensing means for sensing the dominant vibratory frequency produced in said cavity responsive to the flow of fluid past the cavity; and

meter meand responsive to the dominant vibratory frequency sensed by said pressure sensing means for providing an indication of the flow velocity of the fluid flowing past the cavity;

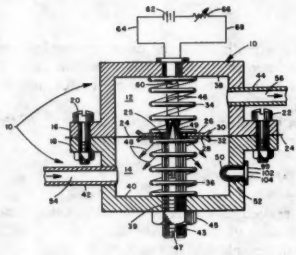
said caity being formed in the wall of a pipe and conprising a recess in said pipe wall, and a chamfer being formed on the upstream edge of said recess.

4,572,004

FLUID FLOW METER FOR MEASURING THE RATE OF FLUID FLOW IN A CONDUIT

Paul R. White, Huntsville, Ala., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Apr. 4, 1985, Ser. No. 719,799
Int. Cl.[4] G01F *1/24*
U.S. Cl. 73—861.58 21 Claims



1. In a device comprising a tube with an enlarged portion formed therein which is separated by a flexible diaphragm into two separate, isolated compartments except for an orifice in said diaphragm sized to allow the maximum tube fluid flow to flow therethrough, a combination of elements in said enlarged portion to measure the rate of fluid flow through said orifice and therefore through said tube comprising:

a tapered element secured within a first of said two compartments into which the fluid flows and having its converging end extend concentrically through said orifice in the direction of said fluid flow to form an annular opening between the tapered element and the perimeter of said orifice whose size varies as the diaphragm flexes in response to the fluid flow in said pipeline;

a light source positioned in the second compartment for directing a beam of light upon the converging end of said tapered element which scatters said beam of light into said first compartment through said annular opening; and

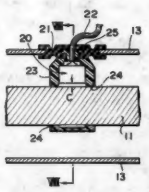
a light detecting means for detecting the amount of scattered light entering said first compartment and therefore the size of said annular opening and the amount of fluid flow.

4,572,005

MAGNETOSTRICTION TORQUE SENSOR

Toru Kita, Yokosuka, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Filed Oct. 5, 1984, Ser. No. 658,213
Claims priority, application Japan, Oct. 19, 1983, 58-195897
Int. Cl.[4] G01L *3/10*
U.S. Cl. 73—862.36 10 Claims



1. A magnetostriction torque sensor for detecting a torsional stress applied to an axle to be measured, which comprises:

(a) an outer tubular member for housing the axle to be measured in such a way as to rotatably support the axle by a pair of bearings attached thereto on either side thereof;

(b) magnetic head means including:

(1) an exciting core having an exciting coil for generating a magnetic field on an outer peripheral surface of the axle to be measured; and

(2) a sensing core having a sensing coil for sensing magnetostrictive components of the magnetic field caused by a torsional stress applied to the axle, said sensing core being arranged at a right angle to said exciting core;

(c) magnetic head holder means for covering and supporting said magnetic head means therewithin, said holder means being formed with bearing portions through which the axle to be measured is rotatably supported in such a way that a predetermined small clearance is kept between a sensing surface of said magnetic head means and the outer peripheral surface of the axle to be measured;

(d) an elastic supporting member for elastically supporting said magnetic head holder means to said outer tubular member in such a way as to allow said magnetic head holder means to be movable in the radial direction of the axle to be measured.

4,572,006

LOAD CELLS

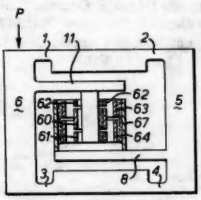
Peter C. F. Wolfendale, 33 Pound Hill, Great Brickhill, Milton Keynes, Bucks, MK17 9AS, England

Filed Jun. 22, 1983, Ser. No. 506,938

Claims priority, application United Kingdom, Jun. 22, 1982, 8217987

Int. Cl.[4] G01L *1/14*; G01D *3/04*

U.S. Cl. 73—862.64 **9 Claims**



5. A load measuring transducer comprising:

a deformable frame structure defined by a first inflexible member that is static, a second inflexible member that moves in response to a load being measured, and a pair of arms spanning the space between the static and moving members and articulated thereto by resilient articulation means, a first element connected to and extending from said static member toward said moving member, and a second element connected to and extending from said moving member toward said static member, said inflexible members, arms and articulation means being formed in one piece and defining a parallelogram linkage that deforms in response to a linear load applied to the moving member to effect movement of said first and second elements relative to one another,

a capacitive transducer mounted on said first and second elements and defining first and second capacitances in the same dielectric medium, said transducer comprising a first cylindrical electrode attached to one of said elements, second and third cylindrical electrodes attached to the other of said elements and disposed in fixed relation to one another, all of said cylindrical electrodes being coaxial with and spaced from one another, and the diameters of said second and third cylindrical electrodes being different from the diameter of said first cylindrical electrode, said first capacitance being defined between said first and second electrodes and said second capacitance being defined between said first and third electrodes, movement of said moving member and the element connected thereto upon application of a load to said moving member being operative to vary the capacitance of at least one of said first and second capacitances, and

a measuring circuit connected to said first and second capacitances of said capacitive transducer, said measuring circuit being operative to provide an output signal denoting the magnitude of the applied load.

4,572,007

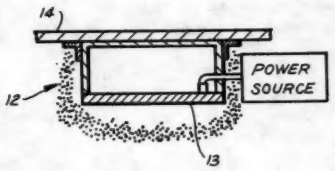
THERMOPHORETIC SEPARATION OF AEROSOL PARTICLES FROM A SAMPLED GAS STREAM

Arlin K. Postma, Halfway, Oreg., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Sep. 7, 1984, Ser. No. 648,197

Int. Cl.[4] G01N *1/22*

U.S. Cl. 73—863.12 **11 Claims**



1. A method for separating aerosol particles from a gas sample being withdrawn from a contained atmosphere, comprising the following steps:

placing within the contained atmosphere a covering gas impermeable enclosure have an interior chamber partly defined by a bottom metal plate that is permeable to gas;

fixing the position of the enclosure with the plate facing downwardly and directly exposed to the contained atmosphere;

heating the metal plate to a temperature greater than that of the contained atmosphere, whereby aerosol particles are repelled to the resulting thermophoretic forces applied to them by the temperature gradient produced in the atmosphere immediately under the plate;

and sampling gas within the interior chamber of the enclosure.

4,572,008

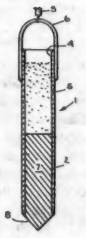
NON-SPARKABLE SAFETY SAMPLE WEIGHT

Kimberly H. Nielson, R.R. 2, Box 229, Sullivan, Ill. 61951, and Lloyd Hudson, 1216 W. Grider St., Sullivan, Ill. 61951

Filed Nov. 13, 1984, Ser. No. 670,498

Int. Cl.[4] G01N *1/12*

U.S. Cl. 73—864.51 **5 Claims**



1. A weighted grain elevator sampling device comprising in combination:

a tubular member having a pointed lower end and an open upper end;

a means for weighing the member position at its bottom portion;

a hollow grain receiving portion open to the open upper end of said tubular member;

a coupling means at the top of said member for attaching it to a sampling line and;

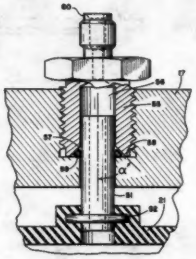
said weighting means being poured in and solidified and having a generally conical point at its lower end.

4,572,009

CONNECTOR FOR CORE HOLDER

Paul R. Braner, Tulsa; Thomas J. Barnickel, and Gary C. Mast, both of Broken Arrow, all of Okla., assignors to Temco, Inc., Tulsa, Okla.

Filed Jun. 18, 1984, Ser. No. 621,537
Int. Cl.[4] G01N *37/00*
U.S. Cl. 73—864.91 **6 Claims**



1. In a core holder having a hollow housing and a resilient sleeve thereon the improvement comprising:

a tubing affixed to said sleeve and extending through said sleeve and protruding outwardly therefrom into, but not through an opening means in said housing in a slidable relation therewith;

a seal seat in said opening means through which said tubing normally extends, said seat being frusto-conically shaped with its large end being nearer to the interior of said housing than the smaller other end of said seat; and

a seal within said seal seat through which said tubing movably extends.

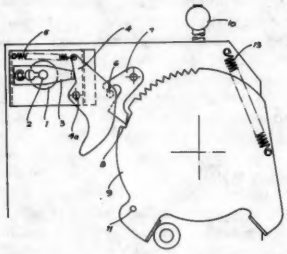
4,572,010

HANDLE RELEASE MECHANISM FOR POKER MACHINES

Joseph R. Heywood, deceased, late of Chorleywood, United Kingdom (by Phyllis A. Heywood, executrix), assignor to 501 Ainsworth Nominees Pty. Limited, Australia

Continuation of Ser. No. 487,151, Apr. 21, 1983, abandoned.
This application Jun. 28, 1985, Ser. No. 750,064
Claims priority, application Australia, Apr. 30, 1982, PF3806
Int. Cl.[4] F16H *5/40*; G07F *17/34*
U.S. Cl. 74—2 **1 Claim**

1. A handle release mechanism for a poker machine comprising a playing handle (10) rotatable about an axis passing through one end of the handle, a plate (9) attached to and rotatable with the handle, a movable lock means (7) mounted adjacent the plate and cooperable with means (8) on the plate to prevent rotation of the plate, said lock means being biased into a first position when the handle is in an initial position to prevent the handle and plate from being rotated, a cam (4), spring means (5) acting on said cam, a solenoid (1) having a spring loaded plunger (2), latch means (3) connected to said plunger arranged to hold said cam in a first position against the bias of said spring means when said solenoid is deenergized, said latch means being displaced by said plunger upon a brief energization of the solenoid to free the cam to move to a second position under the bias of said spring means, means (6) on said cam cooperable with said lock means to move said lock means to a second position in which the handle and plate are free to be rotated when said cam is moved to its second position, and means (11) on said plate cooperable with said cam to move the cam to its first position against the bias of the spring



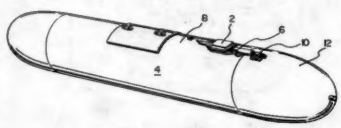
means when the plate is rotated through a predetermined angle to allow the plunger under the bias of its spring to return the latch means to its original position holding the cam in its first position, said lock means moving to its first position when the handle is returned to its initial position.

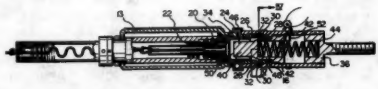
4,572,011

MECHANICAL THRUSTER

Donald B. Mauchlen, Sherkstron, Canada, assignor to Her Majesty the Queen in right of Canada, as represented by the Minister of National Defence, Ottawa, Canada

Filed Oct. 17, 1983, Ser. No. 542,710
Claims priority, application Canada, Dec. 8, 1982, 417293
Int. Cl.[4] F16H *5/74*
U.S. Cl. 74—3.5 **8 Claims**





1. In a canister having separably joined container and lid components, a mechanical thruster for positively separating the container and lid components with respect to each other under a controlled time delay, the thruster comprising:

(a) a frame secured to one of the components;

(b) a mechanical adjustable timing means secured within the frame;

(c) a mechanical actuation means releasably secured to the frame and associated with the timing means to actuate the timing means when the actuation means is released;

(d) movable spring-actuated strike means secured to the frame and mechanically associated with the timing means, movement of the strike means to be actuated by the timing means at a predetermined time interval after the actuation means has been released;

(e) a thruster body secured to the other of the components, the thruster body being normally and releasably secured to the frame against a bias tending to move it away from the frame;

(f) lock means associated with the thruster body and movable with respect thereto from locking position in which movement of the thruster body, when in position secured to the frame, away from the frame, is prevented by obstruction of the lock means, to releasing position in which the lock means does not obstruct movement of the thruster body away from the frame and the thruster body is caused to be propelled away from it under a bias exerted on the thruster body; and

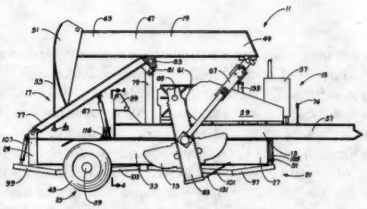
(g) lock releasing means associated with the lock means to normally hold the lock means in locking position, and positioned with respect to the strike means to receive the impact from it and which, upon receiving the impact from the strike means, is displaced to cause the lock means to dislodge from locking position to releasing position and cause the thruster body to be propelled from the frame.

4,572,012

PORTABLE WALKING BEAM PUMP JACK

Roy N. Laney, 1007 Rebecca Rd., Frederick, Okla. 73542

Filed Oct. 18, 1982, Ser. No. 434,725
Int. Cl.⁴ F16H *21/32*
U.S. Cl. 74—41 **3 Claims**



1. A portable walking beam pump jack for use in pumping liquids from an oil well, comprising:

an elongated frame having a longitudinal axis and front and rear ends, said frame also including first and second support seats disposed at vertically spaced apart locations between said front end and said rear end of said frame;

a towing receptacle extending from the front end of said frame for connecting said frame to a towing vehicle;

an axle connected transversely across said frame;

ground engaging wheels connected to said axle for supporting said frame for rolling transportation;

stabilizing means for securing said frame with respect to a ground location;

a walking beam having a first end, a midportion and a second end, said second end being adapted for connection to a pumping rod;

an engine mounted on said frame;

a pair of arms counterweighted for balancing a pumping rod connected to said walking beam, journalled for rotation in parallel planes adjacent to said frame and parallel to said longitudinal axis of said frame, and connected to said engine for rotation responsive to said engine;

a drive yoke extending from said drive arms to said first end of said walking beam, rotation of said arms thereby driving said walking beam in a rocking motion;

a support assembly foldably mounted on said frame and upon which said midportion of said walking beam is pivotally connected, said support assembly said arms and said drive yoke being foldable together, from a first, fixed position in which said walking beam arms and yoke are supported in a raised position for rocking in a pumping motion to a second, fixed position disposed downwardly and forwardly from said first fixed position and in which said walking beam arms and yoke are held in a lowered position for transportation; said support assembly including:

a rear support having first and second ends, said first end being connected to the midportion of said walking beam and said second end being pivotally connected to said rear end of said frame for pivotal, arcuate movement of said rear support in a plane parallel to said longitudinal axis of said frame; and

a front support having first and second ends, said first end of said front support being connected to the midportion of said walking beam, and said second end of said front support being movable between said first support seat for holding said support assembly in said first, fixed position and said second seat for holding said support assembly in said second, fixed position; and

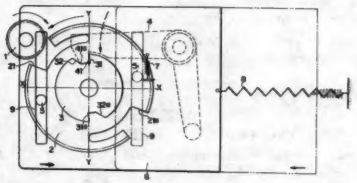
hydraulic cylinder means connected between said frame and said support assembly for moving said support assembly between said first, fixed position and said second fixed position.

4,572,013

INTERMITTENT LINK MECHANISM

Tetsuro Kasukave, Tokyo, Japan, assignor to Clarion Co., Ltd., Tokyo, Japan

Filed Oct. 12, 1983, Ser. No. 541,218
Claims priority, application Japan, Oct. 15, 1982, 57-179877
Int. Cl.⁴ G11B *5/54*
U.S. Cl. 74—50 **1 Claim**



1. An intermittent link mechanism which comprises:

a drive gear;

a driven gear having two circumferentially spaced-apart recesses partly breaking a tooth train thereof so as to intermittently engage with and be discontinuously driven by said drive gear;

a cam integrally formed with said driven gear, said cam having two circumferentially spaced-apart sets of surfaces, each set of surfaces including an engagement surface and a slanting surface;

a stopper engageable with said cam for locking the same, said stopper being formed at one end thereof with a projection including a blocking surface engageable with an engaging surface of said cam and an urging portion engageable with a slanting surface of said cam;

a first spring biasing said stopper for continuous contact with said cam;

a pin formed on said driven gear;

a changeover member having an elongated slot slidably receiving said pin therein; and

a second spring biasing force said changeover member so as to apply a starting rotational force to said driven gear.

4,572,014

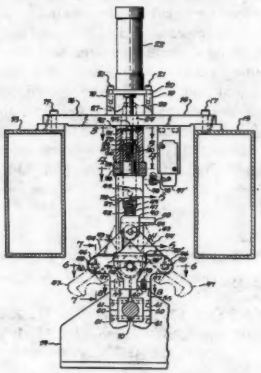
ELONGATED SCREW SUPPORTING CONSTRUCTION

Paul F. Kluczynski, North Tonawanda, N.Y., assignor to St. Mary Manufacturing Corp., North Tonawanda, N.Y.

Filed Jun. 4, 1981, Ser. No. 270,406
Int. Cl.⁴ F16H *27/02, 1/18, 1/20, 29/02*
U.S. Cl. 74—89.15 **15 Claims**

1. In a machine having an elongated screw supported only at opposite end portions thereof and a carriage driven by said elongated screw, a support for stabilizing said elongated screw against whipping while permitting said carriage to pass the

area at which said screw is supported comprising a base, spaced stabilizing means on said base for preventing whipping of said screw, said spaced stabilizing means being oriented radially of said screw, and moving means for selectively moving said spaced stabilizing means radially into and out of engagement with opposite sides of said screw to permit said carriage to pass the area at which said stabilizing means supports said screw.

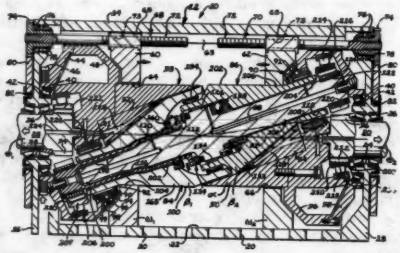


4,572,015

NUTATING TRACTION DRIVE TRANSMISSION

Yves J. Kemper, Birmingham, Mich., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Apr. 4, 1984, Ser. No. 596,495
Int. Cl.[4] F16H *15/16, 37/06, 1/38*
U.S. Cl. 74—191 **52 Claims**



1. In a nutating traction drive transmission of the type having a body rotatable about a central axis, first and second cone-like members rotatably mounted on the body on an inclined axis intersecting the central axis, and a pair of traction rings individually reacting against respectively associated surfaces of the cone-like members, the improvement comprising:

a first shaft mounted within the first cone-like member on the inclined axis;

a second shaft mounted within the second cone-like member on the inclined axis; and

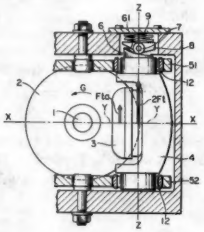
coupling means for transmitting torque independently from the first cone-like member to the first shaft and from the second cone-like member to the second shaft in response to rotation of the body and independent movement of the traction rings along the central axis.

4,572,016

INFINITELY VARIABLE TRACTION ROLLER TRANSMISSION

Hideo Okoshi, Fujisawa, Japan, assignor to Nippon Seiko Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 447,684, Dec. 7, 1982, abandoned. This application Aug. 15, 1985, Ser. No. 766,661
Claims priority, application Japan, Dec. 14, 1981, 56-200197; Dec. 18, 1981, 56-203465
Int. Cl.[4] F16H *15/40, 15/08*
U.S. Cl. 74—200 **15 Claims**



1. An infinitely variable traction roller transmission having a housing, input and output shafts rotably and coaxially journaled to said housing, input and output toric discs mounted on said input and output shafts and rotatable together while being engaged with said shafts, the opposed surfaces of said toric discs cooperating with each other to form a toroidal cavity, a plurality of traction rollers disposed in said toroidal cavity symmetrically with the axis of said input and output shafts, a trunnion device rotably supporting said traction rollers and pivotably supporting the axis of said traction rollers perpendicular to the rotational axis thereof, said trunnion device having a central pivot, and forcing means for firmly engaging said input and output toric discs with said traction rollers and generating a traction force, characterized by the provision of a support device for mounting said trunnion device on said housing for slight translational movement in the direction of the pivot axis, a displacing device provided at the end of the pivot axis of said trunnion device to displace said trunnion device in the rotational direction about its axis, and a spring device acting on said displacing device in accordance with the amount of displacement of said displacing device resulting from said translational movement and in opposition to said translational displacement providing the sole return force to rotate said trunnion device about its axis to balance said displacement.

4,572,017

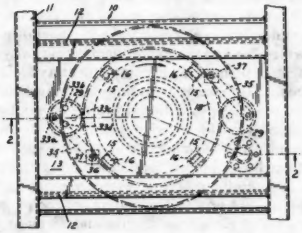
VARIABLE SPEED DRIVE FOR FILLING CUBICLE CONTAINER

Cristiano Rossi, Birmingham, Mich., assignor to Robogate Systems Inc., Mich.

Filed Jun. 8, 1983, Ser. No. 502,328
Int. Cl.[4] F16H *35/02*
U.S. Cl. 74—394 **15 Claims**

1. A rotatable table support for filling cubicle containers with frangible materials from a fixed offcenter discharge hopper, characterized by a fixed base, a horizontal rotatable tabletop pivotally mounted on said fixed base, constant speed power means mounted on said base for rotating said tabletop, and cyclical variable speed transmission means driven by said power means and extending between said power means and

tabletop, said transmission means having a repeat cycle means for each quarter revolution of said tabletop providing a like



single rise and fall in tabletop rotational speed in each quadrant of its rotation.

4,572,018

VEHICLE TRANSMISSION ARRANGEMENT

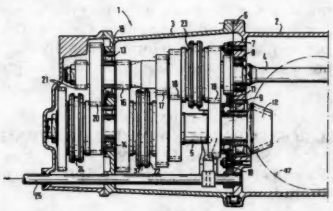
Otto Hausinger, Gerlingen, Fed. Rep. of Germany, assignor to Dr. Ing. h.c.F. Porsche Aktiengesellschaft, Weissach, Fed. Rep. of Germany

Filed Apr. 11, 1984, Ser. No. 598,986

Claims priority, application Fed. Rep. of Germany, Apr. 21, 1983, 3314413

Int. Cl.⁴ F16H *35/06;* **B60K** *20/00, 20/02*

U.S. Cl. 74—397 **12 Claims**



1. An automotive vehicle transmission comprising an input shaft, an output shaft, a gear-change train, including switching rods for selectively shifting the gear ratio between the input and output shafts in dependence on the position of said switching rods, a selector shaft means for directly controlling the position of the switching rods, and a common bearing support means for said output shaft and said selector shaft means for maintaining said output shaft and said selector shaft in a predetermined relative position with respect to one another, whereby a single adjustment of said output shaft will similarly adjust said selector shaft means.

4,572,019

CONTROL DEVICE FOR CONTROL CABLES

Kazuhiro Suzuki, Nishinomiya, Japan, assignor to Nippon Cable System, Inc., Takarazuka, Japan

Filed Sep. 23, 1983, Ser. No. 535,188

Claims priority, application Japan, Mar. 22, 1983, 58-48320

Int. Cl.⁴ G05G *9/02*

U.S. Cl. 74—471 XY **1 Claim**

1. A control device for control cables for operating a remote driven apparatus through at least two control cables by means of a single lever, comprising:

(a) a housing;

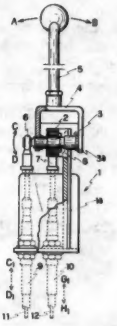
(b) a spherical bearing fixed to a base plate provided generally perpendicular to a top portion of said housing;

(c) a main shaft inserted and fixed into said spherical bearing;

(d) a lever base to which both end portions of said main shaft are fixed;

(e) a single lever fixed to said lever base;

(f) at least two ball joints for connecting cables, which are respectively provided pivotally with said lever base and in which the first ball joint is arranged on the extension line of a center axis of said main shaft and the second ball joint is arranged on extension line in the perpendicular direction to a center axis of said spherical bearing, respectively;



(g) a guide-axis-portion provided with at least one end portion of said main shaft; and

(h) a guide stopper formed by cutting said base plate of said housing at the neighborhood of said spherical bearing, and having cut side surfaces into which said guide-axis-portion is inserted so as to prevent said main shaft from rotating horizontally.

4,572,020

SYNCHRONIZER OF TRANSMISSION FOR VEHICLES

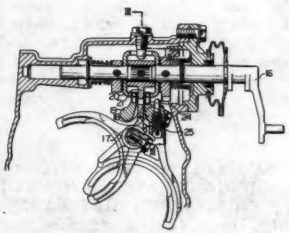
Nobuaki Katayama, Toyota, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Mar. 29, 1983, Ser. No. 479,925

Claims priority, application Japan, Feb. 17, 1983, 58-22138

Int. Cl.⁴ G05G *5/10;* **F16H** *57/10, 3/38*

U.S. Cl. 74—477 **2 Claims**



1. A synchronizer of a transmission for vehicles comprising:

a double-mesh prevention member provided on a shift-and-select lever shaft and adapted to restrict the movement of fork shafts of the transmission, the double-mesh prevention member having at least two engaging portions for engaging first and second forward fork shafts, a first gap between said first engaging portion and said first forward fork shaft being greater than a second gap between said second engaging portion and said second forward fork shaft;

a pin carried by said first forward fork shaft and biased substantially radially outwardly from said first forward fork shaft by resilient means; and

a cam provided on said shift-and-select lever shaft, said cam being shaped and adapted to engage said pin, when said shift-and-select lever shaft is operated to shift to the reverse position, to press said pin so as to move said first forward fork shaft axially until said first forward fork shaft engages said first engaging portion, and thereafter to press said pin radially into said first forward fork shaft;

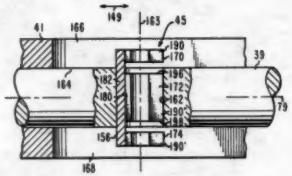
whereby, upon shifting to the reverse position, said first forward fork shaft is moved by said pin and cam to put a synchronizer for forward gears into effect, thereby to attain synchronization between an input shaft and an output shaft of the transmission, but is prevented by said first engaging portion from moving far enough to engage a forward gear.

4,572,021

MOTION TRANSMISSION SYSTEM

Joseph Guarracini, Lawrenceville; Paul E. Shepherd, Lambertville, and Robert W. McQuade, Princeton, all of N.J., assignors to RCA Corporation, Princeton, N.J.

Filed Oct. 3, 1984, Ser. No. 657,170
Int. Cl.[4] G05G *11/00*; F16D *3/06*; F16B *7/10*
U.S. Cl. 74—479 **10 Claims**



1. In combination:

a first cylindrical rod;

a second cylindrical rod having a hollow tubular section adapted to closely, slidably receive said first rod, at least one slot in one of said rods in communication with the other of said rods, the other of said rods having a transverse aperture in communication with said one slot; and

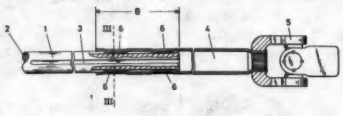
a connecting pin for coupling said first and second rods with negligible rotary backlash, said pin comprising a hollow, semicircular element formed into at least two aligned spaced sections of a given cross-section, each section having a base wall integral with a base wall of the other section, and a pair of aligned cantilevered resilient legs extending from a corresponding base wall, one of said sections being resiliently, compressively engaged with said transverse aperture, the other section being resiliently compressively engaged with said at least one slot.

4,572,022

STEERING COLUMN FOR A MOTOR VEHICLE STEERING MECHANISM AND METHOD OF PRODUCING THE COLUMN

Karl Mettler, Triesen, Liechtenstein, assignor to Etablissement Supervis, Vaduz, Liechtenstein

Filed Jun. 25, 1982, Ser. No. 392,122
Claims priority, application Australia, Jul. 3, 1981, 2966/81
Int. Cl.[4] B62D *1/18*
U.S. Cl. 74—492 **6 Claims**



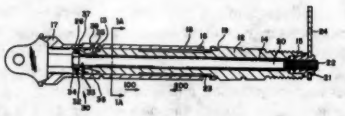
1. Steering column for a steering mechanism used in motor vehicles, said steering column is axially elongated and is formed of at least two axially elongated members arranged coaxially relative to one another, at least one of said members is tubular so that the other said member is inserted into the one said member for an overlapping axially elongated section and is secured in said section against axial and radial displacement, and said one member and said other member in the overlapping axially elongated section have complementary deformed regions produced, said steering column is arranged to collapse telescopically in a collapsing direction after an axially directed force exceeds a given level, wherein the improvement comprises that said other member has an outer surface in said overlapping axially elongated section having grooves formed therein spaced laterally apart and extending parallel with the axis thereof with said grooves extending for the length of said overlapping axially elongated section and extending beyond said overlapping section in the collapsing direction, said one member has axially extending parts permanently deformed beyond the yield point thereof extending radially inwardly into frictional contact with said grooves in said other member so that said one member is secured to said other member without play in the direction of rotation of said steering column about the axis thereof and is in frictional contact at least partially with the outer surface of said other member so that the telescopic collapsing action does not take place until the frictional contact is overcome in the axial direction, said one member has a plurality of axially spaced said parts for each said grooves in said other member with said one member being out of contact with said grooves in said other member between adjacent said parts and said parts deformed in said one member are in interengagement with said grooves in said other member so that said members in said axially extending section are under high radial force, and in the event of a collision said one member and said other member are displaceable in the axial direction relative to one another without deformation and with limited sliding frictional contact between said parts and said grooves.

4,572,023

AXIAL POSITION LOCK FOR TELESCOPING STEERING COLUMN

Richard W. Euler, LaPorte, Ind., assignor to Allied Corporation, Morristown, N.J.

Filed Mar. 26, 1984, Ser. No. 593,447
Int. Cl.[4] B62D *1/18*
U.S. Cl. 74—493 **3 Claims**



1. A telescoping steering shaft, comprising a first elongated shaft defining an axially extending polygonal bore therein, a second elongated polygonal-shaped shaft received for reciprocation in said polygonal bore of the first shaft, the second shaft having a tapered annular end disposed within said bore and having an interior longitudinal opening, an elongated rod received in the interior longitudinal opening and having an enlarged diameter end disposed near said tapered annular end, and an axially movable member for causing rotation and continuous frictional engagement of one of said shafts with respect to the other of said shafts upon axial movement of said movable member in order to eliminate positively torsional lash and axial movement therebetween, said axially movable member having an opening receiving said rod therein and the movable member engaging said enlarged diameter end, the movable member including multi-surface expansion portions comprising a plurality of axially extending projections each with outer surfaces parallel to adjacent surfaces of the polygonal bore and an axially inclined surface disposed parallel to the tapered end, so

that axial displacement of the axially movable member effects engagement of the inclined surfaces with said tapered end to bias said projections radially outwardly into positive locking engagement with said adjacent surfaces of the bore, said axially movable member comprising a collet nut and the plurality of axially extending projections defined between oppositely disposed axial slot openings of said collet nut, a recess disposed within an end of said collet nut, the recess receiving the enlarged diameter end therein in order to effect joint rotational movement therebetween, and a circumferential groove disposed in the collet nut and located axially between said end of the collet nut and the axially extending projections in order to provide flexibility for radial movement of the projections.

4,572,024

RACK AND PINION STEERING GEAR

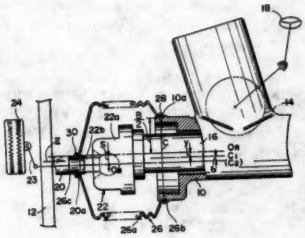
Katsuyuki Narita, Zama, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Aug. 6, 1984, Ser. No. 637,767

Claims priority, application Japan, Aug. 9, 1983, 58-146036

Int. Cl.⁴ B62D *3/12*

U.S. Cl. 74—498 **4 Claims**



1. A rack and pinion steering gear for a road vehicle comprising:

a gear housing mounted on a vehicle body;

a pinion enclosed in said gear housing and rotatable with a manually operated steering wheel;

a rack gear enclosed in said gear housing and meshed with said pinion for reciprocating motion;

a tie rod for transmitting motion of said rack gear to a steerable vehicle wheel;

a ball joint connecting said tie rod to said rack gear and having a center of rotary motion which is offset from the center axis of said rack gear; and

a protective boot covering said ball joint and an associated end of said rack gear and having opposed ends respectively attached to an end of said gear housing and an end of said tie rod;

in which said ball joint includes a ball member ending in a ball and is arranged so that said ball member is axially alignable with a straight line which is parallely offset from the center axis of said rack gear; and

in which said end of said gear housing has a circular outer periphery of which center is substantially equidistant from the center axis of said rack gear and the center of rotary motion of said ball joint when viewed in an elevation perpendicular to the center axis of said rack gear.

4,572,025

BALANCING SYSTEM

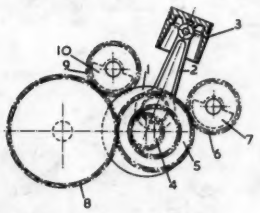
Stephen W. Mitchell, Greater Manchester, United Kingdom, assignor to National Research Development Corp., London, England

Filed Aug. 30, 1984, Ser. No. 645,565

Claims priority, application United Kingdom, Sep. 8, 1983, 8324103

Int. Cl.⁴ F16C *3/20*

U.S. Cl. 74—604 **2 Claims**



1. A balancing system comprising two balance shafts driven from a crankshaft, the crankshaft supporting a first gear meshing with a second internal gear supported by an intermediate member such that the intermediate member rotates in the same direction as the crankshaft, the intermediate member supporting a third external gear meshing with a fourth gear supported by one of the balance shafts and a fifth gear supported by a further intermediate member such that the said one balance shaft and the said further intermediate member rotate in the opposite direction to the crankshaft, and the fifth gear meshing with a sixth gear supported by the other balance shaft such that the said other balance shaft rotates in the same direction as the crankshaft.

4,572,026

GEARBOX FOR A VEHICLE

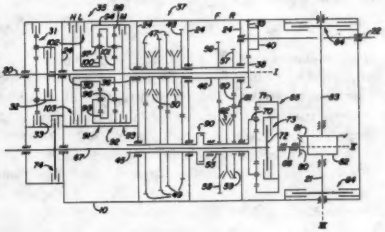
Heinz Weiss, Bensheim, Fed. Rep. of Germany, assignor to Deere & Company, Moline, Ill.

Filed Sep. 6, 1983, Ser. No. 529,470

Claims priority, application European Pat. Off., Jan. 5, 1983, 83300039.1

Int. Cl.⁴ F16H *37/08, 57/02*

U.S. Cl. 74—700 **10 Claims**



1. A gearbox for a vehicle comprising a change-speed gear having a main shaft and a countershaft on first and second longitudinal shaft lines, respectively, an axle having half-shafts on a third transverse shaft line, a transverse differential driving the half-shafts and driven by a component on one of the longitudinal shaft lines, and a casing enclosing the change-speed gear and the differential and having bottom and top parts with a parting plane which contains the first, second and third shaft lines, the change-speed gear providing drive to an intermediate shaft on the first shaft line, the intermediate shaft being coupled

to an output shaft on the second shaft line by selectively engageable forward and reverse gears, and by a selectively engageable coupling acting directly between the countershaft and the output shaft to provide a further range of forward gears.

4,572,027

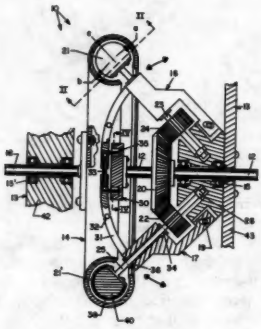
MOTION CONVERTER

Kenneth P. Lusk, 816 Ward St., Ridgecrest, Calif. 93555

Filed May 18, 1984, Ser. No. 611,896

Int. Cl.[4] F16H *5/70, 17/00*

U.S. Cl. 74—812 **4 Claims**



1. Apparatus for converting reciprocating or oscillating motion to uni-directional motion including:

a frame;

first and second coaxial shafts rotatably mounted in said frame;

drive means mounted on one end of said first shaft and means on one end of said second shaft in juxtaposition to said drive means operable to partake of driving forces generated by said drive means;

said drive means cooperating with a plurality of rotatable stub shafts, journalled in said frame for limited pivotal movement about one end and having a driving member on the opposite end thereof, wherein such cooperation between said first shaft and said stub shafts, imparts proportional rotation to said stub shafts upon rotation of said first shaft in either direction;

said driving members on said stub shafts cooperating with said means on said second shaft to impart driving forces thereto; and

shifting means cooperating with said stub shafts to cause said stub shafts to pivot from a first position to a second position as said first shaft changes direction of rotation;

whereby, rotation of said first shaft in either direction will impart uni-directional motion to said second shaft;

means on said second shaft compromising a hollow torroidal body slotted on a surface opposite said first shaft and wherein said driving means on said stub shafts comprise spherical ends faced with frictional materials.

4,572,028

CONTINUOUSLY VARIABLE GEAR DEVICE

Horst Witte, Wiesbaden, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Apr. 21, 1983, Ser. No. 487,302

Claims priority, application Fed. Rep. of Germany, May 3, 1982, 3216459

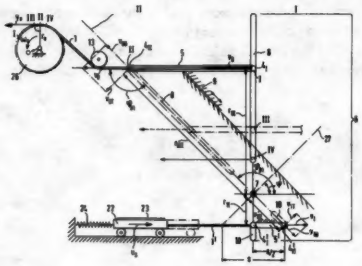
Int. Cl.[4] F16H *35/08*; G05G *1/04*

U.S. Cl. 74—828 **14 Claims**

1. A continuously variable gear mechanism for converting rotary motion into linear motion dependent on the angle of rotation, comprising:

means for converting rotary motion into a straight line motion;

means for changing the stroke of said straight line motion comprising a fulcrum, a swivel arm connected to pivot about said fulcrum, said fulcrum dividing said swivel arm into two lever arms of different lengths, each lever arm



having an end, a first one of said ends being an input end, the second of said ends being an output end, input guide means connected to said first end for moving said first end in response to said straight line motion, whereby said swivel arm pivots about said fulcrum, and output guide means connected to said second end for moving said second end and producing said straight line motion; and

means for changing the distance on said swivel arm between said input guide means and said output guide means.

4,572,029

SPEED CHANGE CONTROL METHOD AND DEVICE OF AUTOMATIC TRANSMISSION FOR VEHICLE

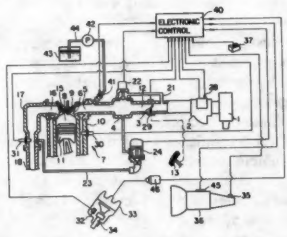
Yukio Kinugasa, Susono, and Takehisa Yaegashi, Mishima, both of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Jan. 8, 1982, Ser. No. 338,051

Claims priority, application Japan, Aug. 26, 1981, 56-132639

Int. Cl.[4] B60K *41/10*

U.S. Cl. 74—866 **6 Claims**



1. A speed change control device of an automatic transmission for a vehicle, said control device comprising:

a first voltage producing means for producing voltage related with engine temperature;

a second voltage producing means for producing voltage related with vehicle speed;

a first comparator for comparing the output voltage of the first voltage producing means with a first predetermined value;

a second comparator for comparing the output voltage of the second voltage producing means with a second predetermined value;

an oil pressure supply controlling means for controlling oil pressure supply to a hydraulic servo for a friction engaging device upon receiving operating signals when a speed change stage producing a reduction gear ratio lower than a predetermined value is to be performed; and

a blocking means for blocking input of the operating signals to the oil pressure supply controlling means only when the engine temperature is lower than the first predetermined value and the vehicle speed is lower than the second predetermined value in response to the outputs of the first and second comparators.

4,572,030

AUTOMATIC TRANSMISSION CONTROL SYSTEM FOR VEHICLE

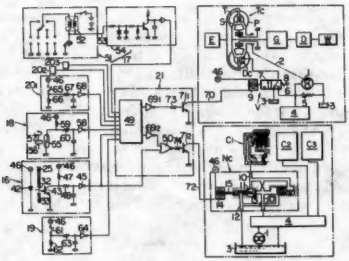
Yoshimi Sakurai, Tanashi, and Junichi Miyake, Hidaka, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 11, 1983, Ser. No. 512,890

Claims priority, application Japan, Jul. 12, 1982, 51-121054

Int. Cl.[4] B60K *41/08;* F16H *47/00;* H01H *3/14;* G01D *5/34*

U.S. Cl. 74—866 **4 Claims**



1. An automatic transmission control system for a vehicle, comprising:

a throttle valve-opening detector including a detection arm mounted on a rotary member associated with an accelerator operating system for controlling opening and closing of an engine throttle valve and being pivotally supported on a vehicle body, said detection arm having at one end thereof a shutter portion, a position detector mounted on a vehicle body and including a light-emitting element and a light-receiving element formed sensitive to an optical beam emitted from said light-emitting element to generate an electric signal, said light-emitting element and light-receiving element being opposed to each other with both side surfaces of said shutter portion interposed therebetween, and an aperture formed in said shutter portion so as to be movable into and out of a gap defined between said light-emitting and light-receiving elements at predetermined rotational positions of said rotary member; and

an electronic controller interposed between said throttle valve-opening detector as well as other detectors and a direct clutch of a torque converter as well as a creep-preventing device for the automatic transmission, said electronic controller being adapted to process output signals from said throttle valve-opening detector and said other detectors to control said direct clutch and said creep-preventing device; said aperture in the shutter portion being so formed that it allows passage of the optical beam therethrough from the light-emitting element to the light-receiving element when said detection arm is rotated by an angle which is between a first predetermined value and a second predetermined value larger than the first predetermined value said creep-preventing device being made operative under a condition where said detection arm is rotated by an angle below said first predetermined value while said direct clutch being made operative under a condition where the detection arm is rotated by an angle which is between said first and second predetermined value.

4,572,031

AUTOMOTIVE DRIVING CONTROL SYSTEM UTILIZING A STEPLESS TRANSMISSION

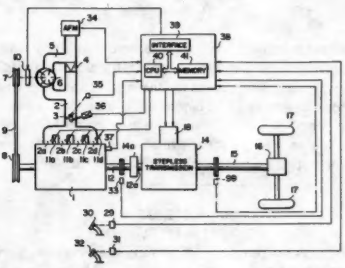
Katsuhiko Yokooku; Nobuhide Seo; Hiroyuki Oda, and Satoshi Yatomi, all of Hiroshima, Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Filed Mar. 21, 1984, Ser. No. 591,841

Claims priority, application Japan, Mar. 26, 1983, 58-50988

Int. Cl.[4] B60K *41/18, 41/12*

U.S. Cl. 74—866 **10 Claims**



1. An automotive driving control system comprising a stepless transmission provided between an engine and driving wheels, a transmission control means for controlling the transmission ratio of the stepless transmission, a throttle valve driving means for driving the throttle valve of the engine, an accelerator position detecting means for detecting the amount of depression of the accelerator pedal, an operating state detecting means for detecting a particular operating state of the engine, a control means which receives the signal from the accelerator position detecting means and controls the transmission control means and the throttle valve driving means to respectively control the transmission ratio of the stepless transmission and the opening degree of the throttle valve so that engine output requirement corresponding to the amount of depression of the accelerator pedal can be obtained, said control means including means for predetermining the engine speed and the opening degree of the throttle valve corresponding to the amount of depression of the accelerator pedal and said control means controlling said transmission control means and said throttle valve driving means to obtain said predetermined engine speed and opening degree of the throttle valve, the control means being adapted to change said predetermined engine speed and opening degree of the throttle valve so that the predetermined engine speed is increased and the predetermined opening degree of the throttle valve is decreased, respectively, without changing the engine output when said particular operating state of the engine occurs.

4,572,032

RETHREADING DIE AND METHOD

Jack A. Kinzler, 107 Pine Shadows Dr., Seabrook, Tex. 77586

Division of Ser. No. 418,229, Sep. 15, 1982, abandoned. This application Jun. 20, 1985, Ser. No. 747,124

Int. Cl.[4] B21K *21/00;* B23G *5/00*

U.S. Cl. 76—101 B **8 Claims**

1. A method of making a rethreading die from a workpiece having oppositely directed front and rear faces and laterally outwardly facing side surfaces about the periphery of said front and rear faces, said method comprising the steps of:

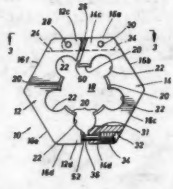
forming recess means in said workpiece for receipt of hinge

means, said recess means providing positioning reference surfaces for said hinge means;

fitting said hinge means in said recess means;

removing said hinge means from said recess means;

dividing said workpiece, generally transversely across said front and rear faces, into a pair of die members, each of



said die members having a first end and a second end, the first ends being disposed generally adjacent each other and adjacent said recess means, and the second ends being disposed generally adjacent each other and spaced about the periphery of said workpiece from said first ends;

replacing said hinge means in said recess means in engagement with said positioning reference surfaces.

4,572,033

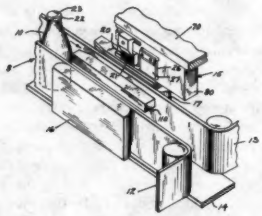
BOTTLE DECAPPER

Herman H. Vanderbush, Jr., Whittier, and Hugh W. Yarbrough, Claremont, both of Calif., assignors to Miller Brewing Company, Milwaukee, Wis.

Filed Apr. 19, 1985, Ser. No. 725,300

Int. Cl.⁴ B67B 7/08

U.S. Cl. 81—3.2 **6 Claims**



1. A bottle decapper for removing twist-type bottle caps from bottles, comprising:

a frame;

a conveyor means for moving the bottles relative to the frame while holding the bottles rotationally stationary relative to the frame;

a cap engaging means positioned above the conveyor means and fixed to the frame, said cap engaging means including:

a primary segment having a hard file surface positioned in a plane to engage a side wall of a passing bottle cap in rolling contact to unscrew the bottle cap from the bottle; and

a back-up segment having a softer surface than said primary segment surface, said back-up segment being positioned downstream from the primary segment surface with said back-up segment surface in approximately the plane of the primary segment surface to engage the sidewall of the cap of a passing bottle in rolling contact; and

wherein the primary segment loosens the bottle caps from the passing bottles and the back-up segment completes unscrewing the bottle caps from the bottles for any bottles from which the caps were not completely unscrewed by the primary segment.

4,572,034

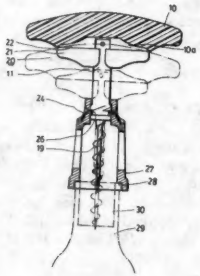
CORK SCREW

Wen-Hsin Lee, 4th Fl., No. 61, Liu Ho I Rd., Kaohsiung City, Taiwan

Filed Nov. 21, 1984, Ser. No. 673,641

Int. Cl.⁴ B67B 7/18

U.S. Cl. 81—3.29 **6 Claims**



1. A cork screw comprising: a rotary handle; a hollow shank of which the wall is provided with two opposite longitudinal apertures and of which one end is fixedly attached to said handle; a bell-shaped pedestal attached to the other end of said hollow shank and adapted to be seated on the top of a bottle, said pedestal being longitudinally movable but not releasable relative to said shank; a cork penetrating spiral member encased in said hollow shank and said pedestal; and a cork pulling lever attached to the top end of said spiral member and passing through said apertures, said pulling lever being separably fitted to the bottom side of said rotary handle and movable along said apertures.

4,572,035

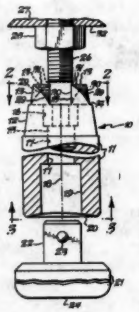
TOOL CONSTRUCTIONS FOR REMOVING FROZEN NUTS

Elroy C. Eisenhauer, 775 Tifft St., Buffalo, N.Y. 14220

Filed Jul. 26, 1984, Ser. No. 634,867

Int. Cl.⁴ B25B 23/08

U.S. Cl. 81—53.2 **9 Claims**



1. A combined nut cutter and wrench tool comprising a body having an axis, a face on said body, a plurality of cutting blades on said body extending outwardly from said face in a generally axial direction, each of said blades having a first side which is inclined relative to said axis and a second side which extends in substantially the same direction as said axis, said first and second sides converging to form cutting edges extending in a generally radial direction relative to said axis and said second sides being oriented to bear against a nut after said blades have been driven into said nut without camming out of

said nut when said tool is turned circumferentially against said nut, and an opening between said blades for receiving a bolt.

4,572,036

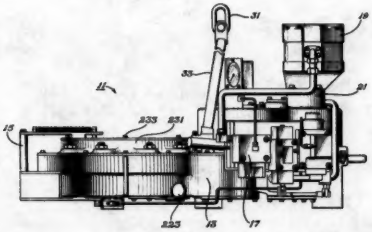
POWER TONG AND JAW APPARATUS

James G. Renfro, Round Rock, Tex., assignor to Hughes Tool Company, Houston, Tex.

Continuation of Ser. No. 576,787, Feb. 3, 1984, abandoned, which is a continuation of Ser. No. 329,972, Dec. 11, 1981, abandoned. This application Apr. 2, 1985, Ser. No. 718,203

Int. Cl.⁴ B25B *17/00*

U.S. Cl. 81—57.2 **7 Claims**



1. In a pipe gripping tong of the type having a stationary housing with a central opening for receiving pipe to be gripped, a ring gear rotatably mounted in said housing for movement about said central opening, a plurality of jaws supported by said housing and movable between an extended position for gripping pipe in said central opening and a retracted position, said jaws being rotatably engaged by said ring gear, and drive means for transmitting rotary motion to said ring gear, wherein the improvement comprises:

a carrier assembly supported by said housing for rotation about said central opening, said assembly comprising upper and lower plates spaced apart by a plurality of pins, said jaws being mounted on said pins between said plates;

said jaws being rotatable to said extended pipe gripping position in either of opposite directions from a single retracted position; and

wherein each of said jaws has a pivot axis about which said jaw rotates in either of opposite directions, said jaw having a pair of symmetrical gripping surfaces which converge to an apex, each of said gripping surfaces being formed in the shape of an Archimedian spiral.

4,572,037

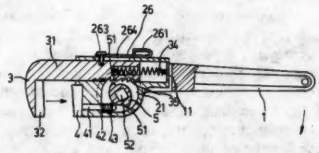
MONKEY WRENCH

Ke Jenq-Shyong, No. 397, Sec. 2 Tan Hsing Rd., Tan Yiang Village, Tan-Tzu Hsiang, Taichung Hsien, Taiwan

Filed Mar. 19, 1984, Ser. No. 590,857

Int. Cl.⁴ B25B *13/12*

U.S. Cl. 81—126 **2 Claims**



1. An improved monkey wrench comprising:

a handle having two prongs each having a square through hole;

a main body rotatably disposed between said prongs of said handle;

a spring loaded jaw mounted to said main body in the way such that said spring loaded jaw may be slightly moved towards or away from said main body;

a movable jaw movably mounted into said main body, said movable jaw having a serrated edge at its lower edge;

a push member slidably mounted on the top of said main body and fixedly attached to said movable jaw in such a way that said movable jaw may be moved in unison with said push member with respect to said main body; and

an actuating member mounted at the center of said main body and fastened to said handle, said actuating member having two teeth which are designed so that when said handle is pressed one said tooth will force said serrated edge to go backward but will force a pin of said spring loaded jaw to go forward.

4,572,038

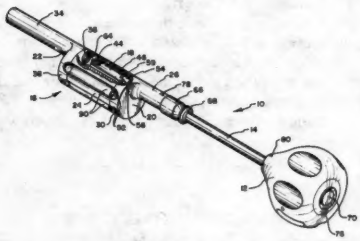
MULTI-PURPOSE TOOL

Charles H. Graham, 7281 South 3080 East, Salt Lake City, Utah 84121

Filed Feb. 8, 1984, Ser. No. 578,365

Int. Cl.⁴ B25B *23/00*

U.S. Cl. 81—439 **68 Claims**



1. A multi-purpose tool comprising:

a plurality of working tips;

a cylinder assembly comprising first and second barrel portions and a cylinder mounted between said barrel portions, said cylinder having a plurality of chambers for housing said plurality of working tips;

a shaft for engaging said working tips, said shaft being mounted to said cylinder assembly in longitudinal sliding engagement, said shaft being movable through said cylinder assembly between a first position and a second position;

means for coupling one of the working tips to said shaft when said shaft is in its first position and the working tip is housed within one of the chambers, the working tip coupled to said shaft being advanced to a working position as said shaft is slidably moved from its first position to its second position; and

means for permitting rotation of said cylinder independent of said barrel portions and said shaft when said shaft is in its first position, and for permitting rotation of said shaft independent of said barrel portions and said cylinder when said shaft is in its second position.

4,572,039

INTERLOCKING LOCK SCREW WITH SCREW DRIVER

Warren Desjardins, 128 Engelke St., Patchogue, N.Y. 11772

Filed May 30, 1984, Ser. No. 615,470

Int. Cl.⁴ B25B *15/00*

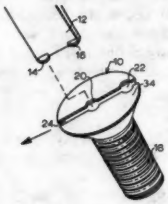
U.S. Cl. 81—451 **8 Claims**

1. An interlocking screw and screwdriver, comprising in combination:

(a) an elongated screwdriver with a tapered blade, a pair of

spaced apart guide dimples each lying in a plane perpendicular to the elongated dimension of the blade and each projecting laterally from opposing sides of the blade at the distal edge thereof; and

(b) a screw with a threaded shank and a screwhead having a top surface including a transverse slot in the top surface for receiving the screwdriver blade and being narrower than the width of said guide dimples, a channel of sufficient width and height to slidably receive said pair of guide dimples and formed into said screwhead beneath



said slot, said slot being narrower than said channel and forming an entry into said channel, a pair of spaced apart guide dimple entry apertures matingly shaped to axially receive said pair of guide dimples and formed into said top surface along said slot and continuing to said channel, whereby the screwdriver blade can be axially inserted into the slot with the guide dimples axially entering the guide dimple entry apertures and is locked in place by moving the blade transversely with respect to the screw to retain said guide dimples in said channel.

4,572,040

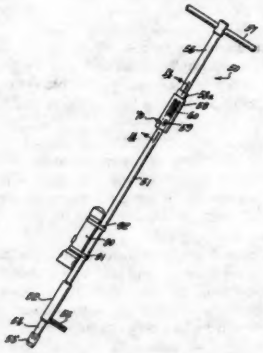
BRAKE ADJUSTMENT TOOL

Delano L. Metz, RT N, Manning La., Pocatello, Id. 83202

Filed May 23, 1984, Ser. No. 613,305

Int. Cl.[4] B25B *19/00*

U.S. Cl. 81—463 **5 Claims**



1. Apparatus for use in testing and adjusting vehicular brakes comprising in cooperative combination: handle means suitable to be handled by an individual; connecting means connecting said handle means to an impact means; socket engaging means connected to said impact means and depending from said impact means in a direction opposite to the handle means; and slack adjustment arm means connected to said socket connection means intermediate its ends.

4,572,041

TORQUE LIMITING WRENCH

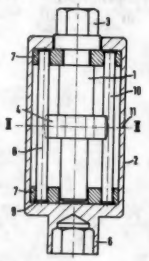
Horst-Günter Rissmann, Trebbiner Strasse 12, 1000 Berlin 61 (West), Fed. Rep. of Germany

Filed May 10, 1985, Ser. No. 732,581

Claims priority, application Fed. Rep. of Germany, Oct. 5, 1984, 3437083

Int. Cl.[4] B25B *25/159*

U.S. Cl. 81—477 **7 Claims**



1. A torque limiting wrench, comprising:

(a) an output member,

(b) an input member aligned with said output member and rotatably supported therewith,

(c) a collar provided on said input member having a plurality of axially directed circumferentially disposed catches, and

(d) a plurality of spring rods, each being associated with a catch of said collar, arranged on a pitch circle disposed coaxially with respect to said input member, at least one of the ends of said rods being radially supported by said output member,

said pitch circle being such that said spring rods, in the tension-free state, are engaged within an associated catch of said collar, said catches being profiled so that when a sufficient torque is applied to said input member, said spring rods bend outwardly in the radial direction and as a result of their design disengage from said catches at a predetermined torque applied to said input member.

4,572,042

CUTTING INSERT

Jörgen V. Wiman, Sandviken, Sweden, assignor to Santrade Limited, Lucerne, Switzerland

Filed Jun. 26, 1984, Ser. No. 624,734

Claims priority, application Sweden, Jun. 27, 1983, 8303657

Int. Cl.[4] B23B *1/00*; B26D *1/00*

U.S. Cl. 82—1 C **14 Claims**

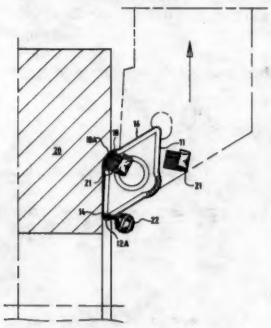
1. A cutting insert adapted for length turning, inwards turning, and transversal turning operations, said insert comprising:

a body having a pair of cutting edges converging at an angle less than ninety degrees to form a cutting nose for performing a cutting operation during length turning and inwards turning operations, and

a protruding cutter portion situated at an end of at least one of said converging cutting edges and protruding transversely beyond a plane containing said at least one converging cutting edge, said protruding portion forming a transverse cutter edge, at least a section of which faces away from said nose to cut coarse and short chips during a transversal turning operation wherein said protruding portion leads said cutting nose, and a portion of said at least one cutting edge disposed adjacent said cutting nose cuts finishing chips.

14. A method of performing a transversal turning operation on a workpiece by means of an insert which comprises a body having a pair of cutting edges converging at an angle less than

ninety degrees to form a cutting nose, and a protruding cutter portion situated at an end of at least one of said cutting edges and protruding transversely beyond a plane containing said at least one converging cutting edge, said protruding portion forming a transverse cutter edge, a section of which faces away



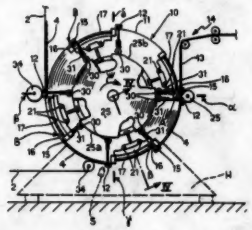
from said nose, said method comprising the step of relatively moving said insert and said workpiece such that said protruding cutter portion leads said cutting nose and said transverse cutter edge cuts coarse and short chips and a portion of said at least one cutting edge disposed adjacent said nose cuts finishing chips.

4,572,043

METHOD AND APPARATUS FOR FORMING ELASTIC ELEMENTS UNDER TENSION FROM A CONTINUOUS ELASTIC WEB, PARTICULARLY FOR MANUFACTURING SANITARY PRODUCTS SUCH AS DISPOSABLE DIAPERS AND THE LIKE

Carlo Bianco, Pescara, Italy, assignor to Fameccanica S.p.A., Italy

Filed Oct. 12, 1984, Ser. No. 660,193
Claims priority, application Italy, Oct. 12, 1983, 68052 A/83
Int. Cl.[4] B32B *31/10, 31/18*
U.S. Cl. 83—18 **11 Claims**



1. A method for forming elastic elements under tension from a continuous elastic web, including the steps of:

providing a supply source of the web;

providing a support for fixing the elastic elements, having a clamping element fixed to the support and a further clamping element movable relative to the fixed element between a first position and a second position; the distance between the fixed clamping element and the movable clamping element in the second position being less than the distance in the first position and substantially equal to the length of the tensioned elastic elements;

clamping the free end of the continuous web in the movable clamping element in the first position;

causing, simultaneously and substantially continuously,

(a) a relative movement between the supply source and the support in the direction of alignment of the clamping elements so as to cause the supply of the continuous web to the fixed clamping element,

(b) the translational movement of the movable clamping element from the first position to the second position at a velocity less than the velocity of the relative movement between the supply source and the support, and

(c) the supply of the web from the source at a velocity less than the difference between the velocity of the relative movement between the source and the support and the velocity of the translation of the movable clamping element from the first position to the second position;

clamping of the web in the fixed clamping element when the movable clamping element reaches the second position, in an arrangement such that a piece of web defining one of said elastic elements extends between the fixed clamping element and the movable clamping element in a state of longitudinal tension the degree of which is determined by the velocity difference and the supply velocity of the web, and

cutting the web in the region between the fixed clamping element and the supply source to separate the tensioned piece from the main body of the web and form a new free end of the web.

4. Apparatus for forming tensioned elastic elements from a continuous elastic web, comprising:

a rotary drum having first clamping elements fixed to the drum and second movable clamping elements aligned in alternation along the outer surface of the drum, each of the movable elements being able to effect a reciprocating translational movement between a first position substantially adjacent the fixed clamping element located upstream in the direction of movement of the surface of the drum and a second position in which each movable clamping element is located in a position intermediate the fixed clamping elements between which it is interposed at a distance from the fixed clamping element located downstream in the direction of movement of the surface of the drum substantially equal to the length of the elastic elements;

first actuator means which can move the movable clamping elements in a disposition such that, in a predetermined region of the path of movement of the surface of the drum, all the movable clamping elements are located in the first position and, during each rotation of the drum, each movable clamping element effects a translational movement from the first position to the second position at a velocity less than the tangential velocity of the surface of the drum;

a supply source which can supply the continuous elastic web to the surface of the drum at a velocity less than the difference between the tangential velocity of this surface and the velocity of the translational movement of the movable clamping elements from the first position to the second position;

second actuator means, which, when the fixed and movable clamping elements provided on the rotary drum move through the predetermined region of the path of movement of the surface of the drum, can close the clamping elements on the web supplied by the source and

a cutting element which can cut the continuous web in correspondence with predetermined region of the path of movement of the surface of the drum,

the operation of the first actuator means, the second actuator means, and the cutting element (35) are synchronised with the rotational movement of the drum, to effect a cyclic sequence of operations including, in order:

the drawing of the free end of the web by the movable clamping element while this movable clamping element moves from the first position to the second position so that, as a result of this drawing, a state of tension is imparted to the portion of the web between the supply source and movable clamping element, the degree of

which is determined by the difference between the tangential velocity of the surface of the drum and the translational velocity of the movable clamping element from the first position to the second position and the supply velocity of the web;

the clamping of the web in the fixed clamping element downstream of the movable clamping element in the direction of movement of the surface of the drum when the movable clamping element reaches the second position, with the consequent formation between the movable clamping element and the downstream fixed clamping element of a piece of web in the said state of

the clamping of the web in a further movable clamping element located in the said first position adjacent the fixed clamping element, and

the operation of the cutting element to cut that portion of the web between the fixed clamping element and the further movable clamping element adjacent thereto, in order to cause the separation from the main body of the web of the piece defining one of the tensioned elastic elements and the formation of a new free end of the web which can be drawn by the further movable clamping element.

4,572,044

METHOD AND APPARATUS FOR SLICING A PRODUCT IN ACCORDANCE WITH ITS ANTICIPATED WEIGHT DISTRIBUTION

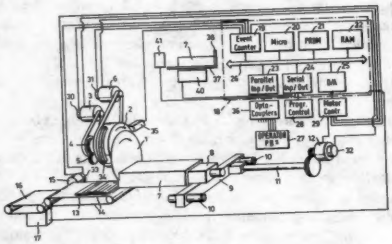
Peter Antonissen, Norfolk, England, assignor to Thurne Engineering Company Limited, Norfolk, England

Filed May 29, 1984, Ser. No. 614,427

Claims priority, application United Kingdom, May 27, 1983, 8314762

Int. Cl.[4] B26D *7/06, 7/27*

U.S. Cl. 83—42 **9 Claims**



1. A method of slicing a non-uniform product comprising weighing said product, measuring the overall length of said product, using said weight and length measurements in conjunction with a weight distribution function for products of that type to establish an anticipated weight distribution for that said product, and then controlling the feed rate of said product through a slicing machine in dependence upon said established anticipated weight distribution.

4,572,045

HORIZONTAL AUTOMATIC PUNCHING MACHINE HAVING A GRIPPING/LIFTING ATTACHMENT AND A TRANSFER STATION

Gerhard Busch, Brookdamm 28, 2105 Seevetal 2 Meckelfeld, Fed. Rep. of Germany

Filed Jun. 27, 1984, Ser. No. 625,234

Claims priority, application Fed. Rep. of Germany, Jun. 28, 1983, 3323212

Int. Cl.[4] B65H *35/00*

U.S. Cl. 83—97 **12 Claims**

1. An automatic punching machine, comprising:

clamping means;

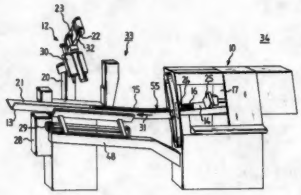
punching means held by said clamping means;

a horizontally movable press plate operative to press pre-cut stacked material past said punching means for punching of said stacked material;

a delivery channel extending beyond said punching means for receiving the punched stacked material;

a transfer station; and

a gripping/lifting attachment disposed adjacent said delivery channel for gripping respective portions of said punched stacked material and transferring said material to said transfer station arranged a short distance away from said delivery channel, wherein said gripping/lifting attachment further comprises a swivel arm capable of swivelling overhead through about 180° and a swivel head arranged at the free end of the swivel and capable of pivotable movement through approximately 90°, so as to correctly orientate the gripped material for subsequent bundling, and wherein the transfer station to which portions of punched stacked material are delivered further comprises a lifting table and means for lowering said lifting table out of a plane of further conveyance so as to not interfere with the delivery.



4,572,046

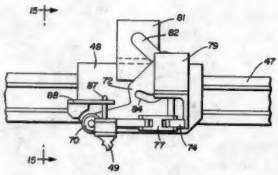
PIVOT MOUNTED CUTTING KNIFE

Donald O. Still, Akron, and Hubert T. Hovance, Ravenna, George J. Burley, Clinton, all of Ohio, assignors to The Firestone Tire & Rubber Company, Akron, Ohio

Filed May 9, 1983, Ser. No. 493,088

Int. Cl.[4] B26D *7/10*

U.S. Cl. 83—171 **7 Claims**



1. A cutting means adapted to sever a planar material comprising:

a. a planar metallic body portion adapted to be pivotally mounted wherein said planar metallic body portion pivots about a pivot point;

b. point means affixed to said body portion generally opposite said pivot point;

c. curvilinear knife edge means affixed to said body portion proximate to said point means;

d. notch means associated with said body portion and located proximate to said edge means, wherein said notch means is adapted to cut said planar material upon displacement of the body portion parallel to said planar material; and

e. displacement means associated with said planar metallic body portion for rotating said body portion about said pivot means in order to impart a rotation to said curvilinear knife edge means while simultaneously causing said

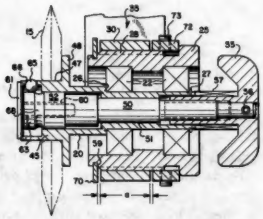
curvilinear knife edge means to be displaced towards said planar material, wherein said notch means are adapted to engage said planar material after the planar metallic body portion has fully penetrated said planar material and is caused to cut said planar material when said body portion is displaced parallel to said planar material.

4,572,047

QUICK CHANGE SLITTER WHEEL HOLDER

Dinesh G. Punater, Dayton, and Gene E. Graves, Centerville, both of Ohio, assignors to Harris Graphics Corporation, Melbourne, Fla.

Filed May 31, 1984, Ser. No. 615,846
Int. Cl.⁴ B26D *1/16*
U.S. Cl. 83—481 **5 Claims**



1. In a holder for a sharpened cutting wheel having a concentric central aperture of predetermined diameter, said holder including

a hollow shaft,

a housing surrounding said shaft and including bearing means supporting said shaft for rotation,

a collet at one end of said shaft and sized to fit closely within the aperture of the cutting wheel,

means on said hub for locating the cutting wheel thereon,

a mandrel having first and second ends and extending through said shaft, and

locking means on said first end of said mandrel coacting with said collet hub to lock the cutting wheel on said hub;

the improvement comprising

spring means urging said mandrel in a direction to engage said locking means,

means for moving said mandrel in opposition to said urging means to release said locking means for quick removal of the cutting wheel, and

a retractable latch member on said collet hub spaced from said locating means and movable outward of said one end of said shaft to interfere with removal of the cutting wheel from said collet hub.

4,572,048

ELECTRONIC MUSICAL INSTRUMENT

Reinhard Franz, Tulpenstrasse 15, D-5401 Emmelshausen; Wilfried Dittmar, Halsenbach, both of Fed. Rep. of Germany; Christian Scheidegger, Buchs, Switzerland, and Roland Fröhlich, Leiningen, Fed. Rep. of Germany, assignors to Reinhard Franz, Emmelshausen, Fed. Rep. of Germany

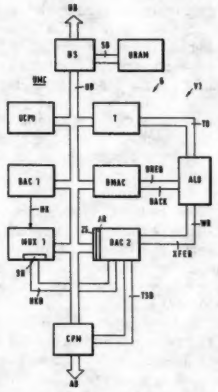
Filed May 21, 1984, Ser. No. 612,533
Claims priority, application Fed. Rep. of Germany, May 21, 1983, 3318669
Int. Cl.⁴ G10H *1/02*
U.S. Cl. 84—1.19 **28 Claims**

1. An electronic musical instrument comprising:

(a) primary computer means;

(b) input means for supplying input signals representing desired tone parameters to said primary computer means; and

(c) voice module means connected with and operative to generate tones in response to the arrival of said input signals at said primary computer means, said voice module means including at least one voice module having a plurality of tone outputs, and said one voice module further having auxiliary computer means designed to store digital data representing tones to be generated, and at least one digital-analog converter unit connected with said auxiliary computer means and including at least one digital-analog converter, and a plurality of analog outputs each of



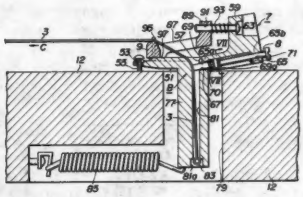
which is arranged to communicate with a respective tone output, said one voice module also having a clocking device for generating clocking signals, and a sequencer responsive to said clocking signals and operative to effect transfer of said digital tone data to said one digital-analog converter unit and to regulate the appearance of analog output signals corresponding to said digital tone data at said analog outputs.

4,572,049

ELECTRIC GUITAR PROVIDED WITH TREMOLO UNIT

Yuji Tanaka, Akishima, and Hideo Matsumoto, Shizuoka, both of Japan, assignors to Tokai Gakki Co., Ltd., Japan

Filed Mar. 21, 1983, Ser. No. 477,023
Claims priority, application Japan, Dec. 31, 1982, 57-198444
Int. Cl.⁴ B10D *3/00*
U.S. Cl. 84—313 **3 Claims**



1. A combination tremolo unit and string securing means for a guitar, which comprises:

a base plate rockingly mounted to the body of the guitar and having openings formed therein to receive the strings of the guitar, the base plate having an upper surface, and further having retaining holes formed therein, and retaining studs received by the retaining holes, the retaining studs having expanded head portions, the retaining holes being formed as elongated and stepped recesses which extend generally parallel to the passing direction of the strings to allow the base plate to rock relative to the guitar body;

a plurality of bridges slidably mounted to the upper surface

of the base plate, the number of bridges corresponding to the number of guitar strings and each bridge supporting a corresponding string, each of the bridges having a through-hole formed substantially centrally therein to allow a corresponding guitar string to pass therethrough, each of the bridges including a projecting lug portion rising at an edge thereof, the projecting lug portion having a threaded through-hole formed therein, each of the bridges further including an adjust screw, the adjust screw being threadingly received by the through-hole formed in the lug portion, and a compression spring encirclingly disposed about the adjust screw;

an upper rising edge portion projecting upwardly from the upper surface of the base plate in proximity to each of the bridges, the upper rising edge portion having formed therein a plurality of bores positioned in alignment with the bridges, each of the bores being dimensioned to loosely receive a corresponding adjust screw, the compression springs being interposed between the bridges and the upper rising edge portion to provide bias to the bridges and cause the same to move upon rotation of the adjust screws, the upper rising edge portion further including a bottom surface, a front wall and an aft wall projecting from the bottom surface, and a recess formed in the bottom surface between the front wall and the aft wall, the front wall having a plurality of holes formed therethrough, and the aft wall having a plurality of holes formed therethrough and generally coaxially positioned with corresponding holes formed in the front wall;

a tremolo block mounted to the underside of the base plate and suspended downwardly therefrom, the tremolo block having through-holes formed therein and extending longitudinally therethrough and communicating with corresponding openings formed in the base plate to receive the strings of the guitar, the tremolo block including a bottom end portion which defines an enlarged opening for each of the through-holes for receiving and restraining eyelets attached to the ends of the guitar strings; and

means for fixing the strings to the tremolo unit, the string fixing means cooperating with a surface of the tremolo block and exerting a holding force on the strings to wedge the strings between the block and the fixing means, the string fixing means including a plurality of fixing screws, each of which extends through a corresponding hole formed in the aft wall of the upper rising edge portion and corresponds to a respective guitar string, a plurality of string pressing rods, each of which is interposed between a corresponding fixing screw and guitar string, each of the string pressing rods having a head of generally disc-like contour with a portion cut away to form a flat peripheral edge, the flat peripheral edge engaging a conforming face of the base plate to prevent the pressing rods from rotating, and a plurality of springs, each of which is interposed between the head of a corresponding pressing rod and the front wall to provide bias to the rod in a direction away from the guitar strings.

4,572,050

NO STRAP SAXOPHONE STAND

Milton M. Werner, 6703 NW. 71st Ct., Tamarac, Fla. 33319

Filed Nov. 21, 1983, Ser. No. 553,554
Int. Cl.[4] G10G *5/00*
U.S. Cl. 84—385 A **6 Claims**

1. Apparatus for supporting a musical instrument having a bell so that said instrument is positioned for playing without needing a strap for a player of said instrument, said apparatus comprising

(a) flexible support means of essentially U-shaped configuration for engaging said bell where said bell is widening to provide fulcrum support means for said instrument at said widening portion to one side of the center of gravity of said instrument;

(b) additional support means of essentially U-shaped configuration offset vertically from said flexible support means and offset horizontally from said flexible support means in the same direction as said center of gravity to support said instrument thereagainst in such a position that said instrument has its mouthpiece in a position convenient for playing; and

(c) means for supporting said flexible support means and said

additional support means in said offset relation to provide said convenient position for said mouthpiece,

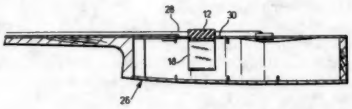
the essentially U-shaped configuration of said flexible support means and of said additional support means allowing said instrument to be mounted on said apparatus in said convenient position or removed from said apparatus without requiring disassembly of said apparatus.

4,572,051

HUMIDIFICATION DEVICE FOR MUSICAL INSTRUMENTS

William Laskin, 192 Dupont St., Toronto, Ontario M5R 2E6, Canada

Filed Aug. 1, 1984, Ser. No. 636,777
Int. Cl.[4] G10G *7/00*
U.S. Cl. 84—453 **11 Claims**



1. A humidification device for a stringed musical instrument having a hollow main body with tensioned strings extending across the body, said device comprising:

a bag comprising porous synthetic plastic material which permits water vapour and not water droplets to pass therethrough, said bag having releasable sealing means for opening and closing the bag,

a water-absorbing material in said bag, and

attachment means carrying said bag and attachable to at least a pair of strings of an instrument to position the bag adjacent or in the instrument body.

4,572,052

DECLIPPER/FEEDER

Joseph L. Johnson, Canadian, Okla., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed May 5, 1983, Ser. No. 491,840
Int. Cl.[4] F42B *39/10*
U.S. Cl. 86—48 **2 Claims**

1. A combination declipper and feeder for use in removing an individual clip from a plurality of cartridges held together in

alignment by such clip and feeding said declipped cartridges to a tray for further assembly into a belt comprising:

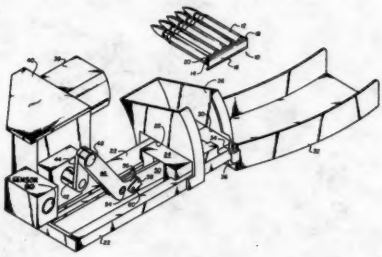
a vertical chute receiving a plurality of gravity feed clipped cartridges,

said chute having a bottom provided with an aligned first and second slot,

a push block reciprocating across said chute from said first to said second slot,

said second slot having a vertical edge against which said clip abuts declipping said clipped cartridges as said reciprocating block pushes said cartridges through said second slot said chute having a gap adjacent said edge through which said declipped clip falls by gravity,

a crank having a rotary shaft driven by a motor,



said push block connected to said crank by pivotally connected first and second arms,

said first arm connected to said crank and said second arm pivotally connected to said block,

a sloping slightly curved feed tray adjacent said second slot to receive said declipped cartridges,

said curve facilitating the natural roll of said declipped cartridges,

a guard overhead said feed tray to prevent spillage, and

a sensor having a microswitch provided with an activating contact plate also overhead said feed tray,

said sensor deactivating the reciprocation of said push block when said tray is full of cartridges.

4,572,053

ORDNANCE EJECTOR SYSTEM

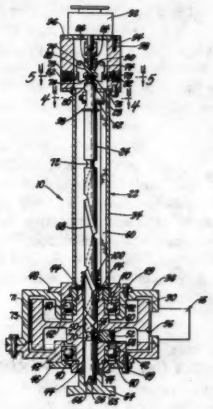
Joseph A. Sosnowski, Norristown; Gary Black, Hatfield, and Robert J. Pritchard, Lansdale, all of Pa., assignors to Teleflex Incorporated, Limerick, Pa.

Filed Feb. 27, 1984, Ser. No. 583,718

Int. Cl.[4] F41F *5/02*

U.S. Cl. 89—1.51 **24 Claims**

22. An actuator system (10) for storing and releasing energy comprising: a driven member (24); energy storage means for storing kinetic energy within said system (10) to move said driven member (24); and characterized by clutch means for converting the kinetic energy of said energy storage means to mechanical movement of said driven member (24) and for maintaining constant velocity of said mechanical movement as



the kinetic energy is dissapated from said energy storage means to a lower level.

4,572,054

EXACT POSITION FEEDBACK OF DOUBLE-ACTING POWER PISTON IN HYDRAULIC CYLINDERS

Heinz D. Hannes, Düren-Echtz; Josef Lothmann, Langerwehe, and Ludwig Walther, Düren-Niederau, all of Fed. Rep. of Germany, assignors to Zimmermann & Jansen GmbH, Duren, Fed. Rep. of Germany

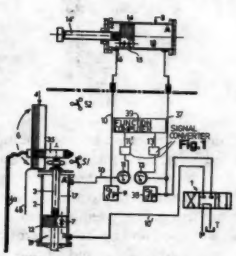
Continuation-in-part of Ser. No. 249,925, Apr. 1, 1981, Pat. No. 4,478,129. This application Feb. 27, 1984, Ser. No. 583,601

Claims priority, application Fed. Rep. of Germany, Apr. 15, 1980, 3014432

The portion of the term of this patent subsequent to Oct. 23, 2001, has been disclaimed.

Int. Cl.[4] F01B *25/26*

U.S. Cl. 91—1 **18 Claims**



1. An apparatus for the exact position feedback of a double-acting power piston in a hydraulic power cylinder subjected to extreme environmental conditions, especially high temperatures comprising: a double-acting detecting follower cylinder having a displacement volume equivalent to that of said power cylinder; a detecting piston in said detecting cylinder; an electrical detection means for detecting and indicating the position of said detecting piston; a first fluid conduit connecting the working space on one side of said power piston to said detecting cylinder on one side of said detecting piston; a second fluid

conduit connected to the spaces in said cylinders on the other sides of said pistons; a fluid pump; a fluid reservoir; a control valve operatively connected in said second conduit to selectively connect said spaces on the other sides of said pistons to said pump, and to said reservoir; a fluid channel extending through each piston substantially parallel with the respective cylinder axis interconnecting the spaces in each respective cylinder on opposite sides of the piston; a pair of oppositely acting check valves in each channel having respective valve elements and valve seats to control the flow of fluid therethrough; plungers operatively mounted in said pistons and protruding beyond each respective piston face operatively engageable with said valves so that upon contact with the respective opposing cylinder end face said plungers lift said valve elements off their respective valve seats; a conduit through each plunger to facilitate fluid flow therethrough when the associated valve is open; and a piston rod extending from each side of said detecting piston through the ends of said detecting cylinder.

4,572,055

VACUUM POWER BRAKE BOOSTER

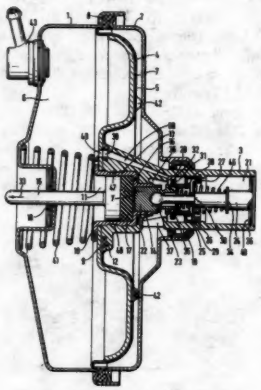
Lothar Schiel, Eppstein, Fed. Rep. of Germany, assignor to ITT Industries, Inc., New York, N.Y.

Filed Aug. 22, 1984, Ser. No. 643,068

Claims priority, application Fed. Rep. of Germany, Aug. 24, 1983, 3330481

Int. Cl.[4] F15B *9/10*

U.S. Cl. 91—369 A **5 Claims**



1. A vacuum power brake booster including a vacuum casing subdivided by at least one movable partition wall into at least one vacuum chamber and at least one working chamber, said partition wall connected to an axially movable control hub including a control valve assembly means operatively associated with a piston rod and brake pedal for movement between a brake fully released position and a brake applied position, the control hub acting on a force-delivering member via a reaction device, the invention in which said valve assembly means includes a piston cooperating with a poppet valve member including an axial air passage defining an inner peripheral surface and including an end surface at an end thereof closest to said valve piston extending radially relative to the axis of said axial passage defining a circular edge at the junction of said inner peripheral surface and said end surface, said valve piston including a right circular, truncated-cone-shaped end defining a conical peripheral surface facing said end surface, said conical peripheral surface being in sealing abutment with said circular edge on said poppet valve in the brake fully released position.

4,572,056

PLUNGER OR FLOATING PISTON PUMP

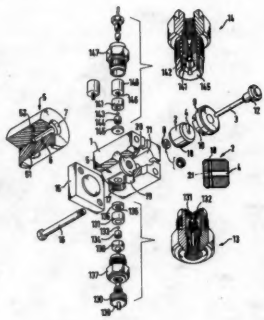
Herbert Funke, Krailling, Fed. Rep. of Germany, assignor to Saphirwerk Industrieprodukte AG, Nidau, Switzerland

Continuation of Ser. No. 378,741, May 17, 1982, abandoned. This application Nov. 8, 1984, Ser. No. 669,443

Claims priority, application Fed. Rep. of Germany, Jun. 3, 1981, 3122091

Int. Cl.[4] F01B *31/10*; F16J *15/18*; F04B *39/02*

U.S. Cl. 92—86 **2 Claims**



1. In a pump having a pump head casing with a bore, the improvement comprising:

a pump head liner positioned in said bore end having a displacement chamber open at one end and an annular groove at said one end;

a plunger guide bushing of ceramic material and having a guide bore and fitted in said casing bore in axial alignment with said pump head liner and adjacent to said one end of the pump head liner;

a resilient annular seal positioned in said annular groove; and

a plunger of sapphire extending through said guide bore, said annular seal and into said displacement chamber through said open end thereof, the diameter of the plunger inner end in said displacement chamber being less than that of the displacement chamber to avoid contact therebetween, the plunger defining an outer end portion provided with means for transmitting axial forces only to the plunger in effecting axial reciprocation thereof whereby said plunger is guided for axial movement solely by the plunger guide bushing free of substantially all transverse forces, thereby providing accurate centered reciprocation of the plunger with extremely accurate play-free cooperation between the long-wearing, substantially equally hard ceramic and sapphire surfaces avoiding radial deflection of the plunger and flexing and wear of the annular seal; and said plunger guide bushing having means for flushing the guide bore comprising a peripheral internal groove and a transverse through bore crossing said groove in a radial direction adjacent the end of the plunger guide bushing facing said annular seal.

4,572,057

PNEUMATIC OR HYDRAULIC ACTUATION DEVICE

Peter Wewerka, Schongau, Fed. Rep. of Germany, assignor to Hoerbiger Pneumatic Gesellschaft mbH, Schongau, Fed. Rep. of Germany

Filed Jul. 17, 1984, Ser. No. 631,762

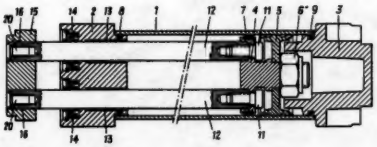
Claims priority, application Fed. Rep. of Germany, Oct. 21, 1983, 8330419[U]

Int. Cl.[4] F16J *1/14*

U.S. Cl. 92—165 PR **6 Claims**

1. In a fluid actuation device which includes a cylinder having opposite open ends; a cover enclosing one of the oppo-

site open ends of said cylinder, said cover including two bores extending therethrough; a piston movably positioned within said cylinder; two piston rods which sealingly extend through the two respective bores in said cover, said piston rods having first ends which are fixedly attached to said piston and second ends which are located outside the cylinder; and a securing disc associated with the second ends of said piston rods; the



improvement wherein said securing disc has an outer periphery and wherein it includes two bores extending therethrough in which the second ends of said piston rods can extend, said securing disc also including separate slots therein which extend from its outer periphery to its two bores and clamping means for closing each of said slots to fixedly grip the second ends of said piston ends in said bores therein and thus prevent twisting of said piston rods as said piston moves within said cylinder.

4,572,058

PISTON CYLINDER SYSTEM, ESPECIALLY FOR INTERNAL COMBUSTION ENGINES

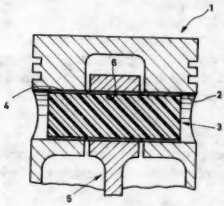
Bernhard Hinz, and Gerhard Grüninger, both of Stuttgart, Fed. Rep. of Germany, assignors to Deutsche Forschungs- und Versuchsanstalt für Luft- und Raumfahrt e.V., Bonn, Fed. Rep. of Germany

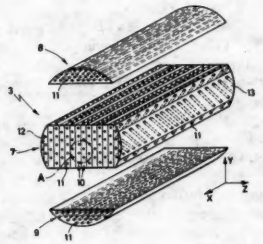
Filed May 2, 1984, Ser. No. 606,200

Claims priority, application Fed. Rep. of Germany, May 6, 1983, 3316514

Int. Cl.[4] F16J *1/14*

U.S. Cl. 92—187 **28 Claims**





1. Piston cylinder system, especially for internal combustion engines, with a piston pin made of a fiber-reinforced composite material, in which fibers running in different directions are placed, for the rotating connection of a piston and a connecting rod, characterized by the fact that the piston pin (3) is secured against rotation around its longitudinal axis (x-axis) in the piston (1), and has first regions (layers 10*b*, 10*c*; layers 17, 18), in which the fibers (11; 20) are arranged in planes running parallel to the piston pin axis (X-axis), running parallel to the piston axis, in such a way that they have a componant running parallel to the piston axis and that in second regions (layer 10*a*, top section 8, bottom section 9, side sections 14, 15) of the piston pin (3), fibers (11; 21) are positioned running parallel to the piston pin axis (X-direction).

4,572,059

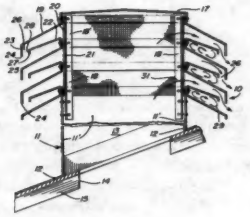
STATIC VENTILATOR CONSTRUCTION

Jean R. Ramsay, 6161 Des Angevins, Ville d'Anjou, Québec, Canada

Filed Aug. 6, 1984, Ser. No. 637,768

Int. Cl.[4] F23L *17/02*

U.S. Cl. 98—42.22 **8 Claims**



1. A static ventilator comprising a hollow housing having a circumferential sidewall, a closed top end, and an open bottom end; one or more vent openings horizontally disposed in said sidewall, at least two downwardly sloping flat hood plates secured above and below each said one or more vent openings and having a downwardly extending outer end flange having a free end edge, and an anti-squall flat deflector plate secured below said one or more vent openings intermediate said hood plates, said hood plates being disposed at a sloping angle greater than the sloping angle of said deflector plate, an unobstructed vent chamber is defined between said deflector plate and an upper one of said hood plates and communicates with one of said vent openings, said anti-squall deflector plate having a downwardly extending skirt formed at a free end edge thereof to cause a downward air flow below said deflector plate in the area of said free end edge and an upper surface of a lower adjacent one of said hood plates, said skirt terminating a short distance above the horizontal plane of said free end edge of a top one of said two hood plates and terminating short of the outer end flange of said top hood plate to define a vent port between said hood end flange and free end of said deflector plate communicating with said vent opening between said two hood plates, said deflector plate preventing foreign matter from entering said vent openings.

4,572,060

COFFEE BOILER WITH AN AUTOMATIC FEEDING DEVICE

Wei Y. Yung-Kuan, No. 1, Lane 970, Sec 2, pen tien St., Tainan, Taiwan

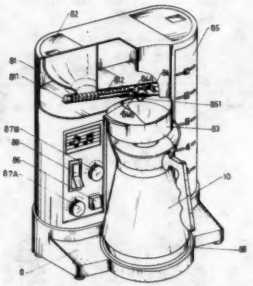
Filed Oct. 22, 1984, Ser. No. 663,545

Int. Cl.[4] A47J *31/00*

U.S. Cl. 99—280 **2 Claims**

1. In a machine for making hot beverages having a hopper for beverage grounds, a motor driven screw conveyor for delivering grounds from the hopper into a beverage mixing chamber, and delivery means for delivering hot water to the mixing chamber, the mixing chamber having an outlet for delivery into a beverage flask or the like, the improvement

wherein the screw conveyor has a tubular casing with an outlet end located above an inlet leading into the mixing chamber, the machine including an electrically operated reciprocatory member having a disk portion providng a first valve for selectively opening and closing against the outlet end of the conveyor casing and a plate portion providing a second valve for simultaneously sliding over the mixing chamber inlet, and



electric circuit means for controlling the reciprocatory member so as to simultaneously open the conveyor outlet and the mixing chamber inlet in unison to supply grounds to the mixing chamber and subsequently to simultaneously close the conveyor outlet and mixing chamber inlet in unison, the first and second valves inhibiting heated water vapor in the mixing chamber from entering the screw conveyor and grounds hopper.

4,572,061

HEATING FOOD ARTICLES

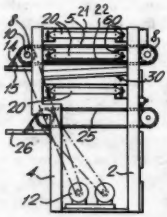
Adrian G. Masters, Maidenhead, England, assignor to United Biscuits (UK) Limited, Edinburgh

Filed Dec. 8, 1983, Ser. No. 559,230

Claims priority, application United Kingdom, Dec. 10, 1982, 8235277

Int. Cl.[4] A47J *37/04*

U.S. Cl. 99—331 **17 Claims**



1. Apparatus for heating food articles, said apparatus comprising:

means defining a heating chamber to receive a food article therein, said means including floor means located beneath said food article;

means for heating the interior of said heating chamber,

means to heat a food article received therein;

impeller means for inducing a cooling air flow beneath said floor means;

means for sensing the temperature of said floor means; and

control means controlling operation of said impeller means in response to said sensed temperature.

4,572,062

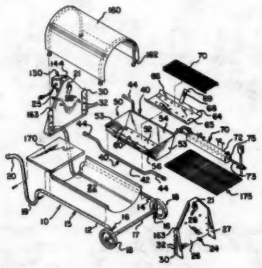
ROTISSERIE GRILL

Richard E. Widdowson, 1620 Maplegrove Ave., Dayton, Ohio 45414

Filed Jan. 7, 1985, Ser. No. 689,424

Int. Cl.[4] A47J *37/04*

U.S. Cl. 99—345 **13 Claims**



1. In a roasting machine for roasting relatively large items of food, such as small pigs or the like, on a rotating roasting spit, the improvement comprising:

a frame including a pair of side frame members extending in generally parallel relation and having means forming ground-engaging ends at each end thereof,

a pair of transversely spaced-apart, generally upstanding end supports extending between said side frame members,

an ash pan interconnecting said frame members and positioned longitudinally thereon between said frame members,

a generally rectangularly-shaped firebox proportioned to be received between said supports,

a pair of handlebars having an intermediate portion receivable in supporting relation to opposite sides of said firebox and having hand gripping ends,

means on said end supports defining pairs of vertically spaced handle bar receiving notches by means of which said handlebars may be suspended at varying elevated positions on said end supports, to suspend said firebox therebetween at correspondingly selected elevated positions,

an elongated rotisserie spit,

means on said end supports for rotatably receiving said spit longitudinally therebetween in elevated relation to said firebox, and

motor means on one of said end supports for driving said spit.

4,572,063

VIBRATORY GRAIN SEPARATING APPARATUS

Shoichi Yamamoto, 813-17 Oaza Tendou Kow, Tendou-Shi, Yamagata-Ken, Japan

Division of Ser. No. 522,093, Aug. 11, 1983. This application Jan. 28, 1985, Ser. No. 695,628

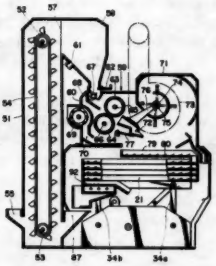
Claims priority, application Japan, Dec. 2, 1982, 57-211781; May 14, 1983, 58-84754

Int. Cl.[4] A23N *5/00*; B02B *3/00*

U.S. Cl. 99—524 **4 Claims**

1. A grain hulling apparatus comprising a frame, an unhulled rice lifter mounted adjacent to and extending above said frame, a vibratory separating section provided on said frame adjacent one side of said unhulled rice lifter, a single hulling section including a pair of hulling rollers mounted on said frame to rotate about parallel axes above said vibratory separating section and adjacent the side thereof nearest said unhulled rice lifter to receive unhulled rice therefrom, said hulling section being operative to discharge hulled, processed rice onto a

vibrating surface of said separating section, and an air-blow separating section provided on said frame adjacent one side of said hulling section, the processed grain discharged from said



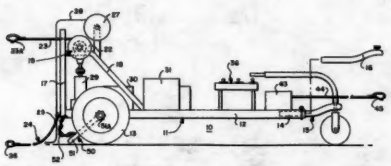
hulling section being subjected to a stream of air in said air-blow separating section, whereby said air stream separates hulls from the processed grain during passage thereof from said hulling section to said vibratory separating section.

4,572,064

BRUSH BUNDLING SYSTEM

R. Edward Burton, 23881 Sherwood Rd., Willits, Calif. 95490

Filed May 23, 1984, Ser. No. 613,096
Int. Cl.⁴ B65B *13/20*
U.S. Cl. 100—8 **18 Claims**



1. In a brush bundling system,

an elongated vertical frame;

at least a pair of long straps fastened at one end to horizontally separated points on said frame and having free ends adapted to be positioned on the ground a long distance behind said frame to enable a large volume of cut brush to be piled on said straps;

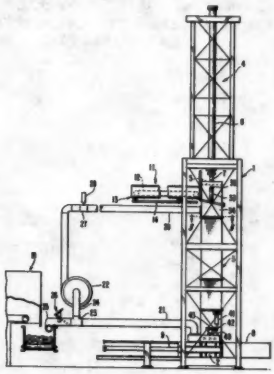
a tensioning means mounted on said frame and adapted to be fastened to said free ends of said straps for pulling said straps around said volume of cut brush to compress said brush into a tight bundle, whereupon said compressed bundle may be strapped with a steel strap or other strapping or tying material to retain the bundle in its compressed state, said tensioning means comprising a pair of strap reels rotatably mounted to said frame at positions generally in vertical alignment with the fastening point for said pair of straps, a long strap carried on each of said strap reels and having a free end adapted to be extended over a pile of brush and to be attached to the free end of a corresponding one of said pair of straps, a motor drive means for driving each of said strap reels to wind up said strap carried thereon and thereby to compress said bundle of brush.

4,572,065

METHOD AND APPARATUS FOR PACKING TOBACCO

Francis B. Fishburne, 174 Weston Rd., Arden, N.C. 28704

Filed Jun. 18, 1984, Ser. No. 621,763
Int. Cl.⁴ B30B *1/32, 15/30*
U.S. Cl. 100—35 **9 Claims**



1. In the packing into a case or bale of leaf or stripped tobacco delivered from a redryer, wherein packing is accomplished with a packer having a compression chamber, an upright charger and means for supplying loose redried tobacco to the top of the charger, the method comprising

providing a press head which can be moved downwardly and upwardly through the charger and is of such size and shape that, when the press head is within the charger, clearance between the periphery of the head and the wall of the charger is very small;

supplying loose redried tobacco to the charger at the top thereof and allowing the tobacco to fall freely in the charger until a predetermined first quantity of tobacco less than that required for the case or bale has collected in the compression chamber and charger in the form of a loose and substantially uncompacted mass of tobacco;

maintaining the press head within an upper portion of the charger to close the upper portion of the charger against upward escape of air save via the very small space between the periphery of the press head and the charger wall;

establishing a volume of air under positive pressure between the press head and the mass of loose tobacco and, while the volume of air under positive pressure exists above the tobacco, withdrawing air from the bottom of the charger, whereby an air pressure differential is established across the height of the mass of loose tobacco,

the air under positive pressure above the tobacco then applying a downward force on the top of the mass of tobacco;

continuing the air pressure differential until the mass of loose tobacco has been downwardly compacted by said downward force to such an extent that the charger will accommodate a second quantity of tobacco;

then supplying a predetermined second quantity of loose redried tobacco to the charger to bring the total quantity of tobacco in the compression chamber and charger to that required for the case or bale; and

compressing the total amount of tobacco into the compression chamber by forcing the press head downwardly through the charger to produce a compressed cake of tobacco in which no line of demarcation between the two quantities of tobacco is observable.

4,572,066

APPARATUS FOR APPLYING A LENGTHENING ROD AND FOR REEL PRESSING IN CONNECTION WITH A DYEING BASKET FOR YARN REELS

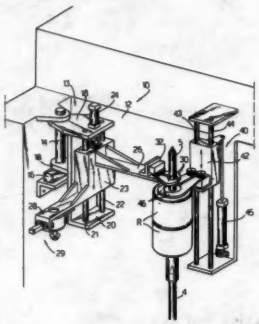
Ornella Raveggi, Montecatini Terme, Italy, assignor to Officine Minnetti Di Federico Minnetti & C.S.A.S., Pieve A Nievole (Pistoria), Italy

Filed Aug. 7, 1984, Ser. No. 638,499

Claims priority, application Italy, Oct. 6, 1983, 23176 A/83

Int. Cl.[4] B30B *15/06*

U.S. Cl. 100—295 **5 Claims**



1. An applying and/or removing apparatus for applying and/or removing a lengthening rod on a spindle of a dyeing basket, on which spindle and rod yarn reels having a compressible core are applied forming a pile and then pressed to the height of said spindle, said apparatus comprising gripping means for gripping the lengthening rod, said gripping means including jaws movable between closed and open positions, said jaws having gripping seats of suitable shape to grip said lengthening rod; and means for moving said jaws in a direction parallel to the axis of said spindle.

4,572,067

PETRI DISH IMPRINTING APPARATUS

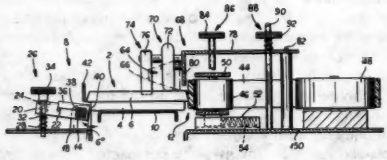
Thomas Fischer, Zurich, Switzerland, assignor to Tecnomara AG, Zurich, Switzerland

Filed Nov. 29, 1984, Ser. No. 676,183

Claims priority, application Switzerland, Nov. 29, 1983, 6376/83

Int. Cl.[4] B41F *17/20*

U.S. Cl. 101—7 **18 Claims**



1. An apparatus for inscribing identifying indicia onto a circumferential wall of a petri dish covered by a cover loosely seated on said wall and having a circumferential skirt partly overhanging said wall, comprising:

means forming a support surface upon which a bottom of a covered petri dish can rest and along which said petri dish can be shifted;

imprinting means in the form of a block disposed at a generally fixed location along one side of said support surface and having heatable characters adapted to imprint said wall of said petri dish upon rolling displacement of said wall of said petri dish along said block;

an endless conveying and pressing band yieldably bearing laterally against said skirt of said cover of said petri dish on the opposite side of said support surface for urging said wall against said block and inducing said wall to roll against said block whereby said wall is thermally embossed with imprints of said characters; and

a holddown element for pressing said cover down onto said petri dish and thereby to press said petri dish against said support surface at least in the region of said imprinting means, said holddown element comprising a roller rotatable about an axis transverse to the direction of movement of said petri dish and bearing on said cover from above and a device for adjusting the force with which said roller bears against said cover.

4,572,068

DECORATING SYSTEM FOR CERAMIC FLATWARE

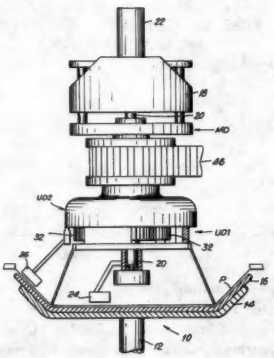
Octavio Herrera Giammattei, Monterrey; Federico Veramontes Brown, Garza Garcia; Benedo Beltran Leyva, Mexicali, and Damian Cervantes Patino, Monterrey, all of Mexico, assignors to Vitro Tec Fideicomiso, Monterrey, Mexico

Filed Dec. 13, 1984, Ser. No. 681,007

Claims priority, application Mexico, Dec. 15, 1983, 199772

Int. Cl.[4] B41F *17/00*

U.S. Cl. 101—35 **3 Claims**



1. A device for decorating ceramic flatware, comprising:

an axially moveable but rotationally fixed shaft;

a carrier for planetary gears supported on said rotationally fixed shaft;

planetary gears journalled in said carrier;

a central gear journalled within said carrier and meshed with said respective planetary gears;

said central gear carrying a first applicator for coloring material;

a header rotatable on said rotationally fixed shaft and carrying a second applicator for coloring material;

a ring gear carried by said header and meshed with said respective planetary gears; and,

drive means for rotating said header whereby rotational movement of said header produces rotational movement of said planetary gears and of said central gear, thus enabling both of said applicators of coloring material to be driven on separate circular paths.

4,572,069

DEVICE FOR CHANGING A NUMBERING AND IMPRINTING DEVICE IN A PRINTING PRESS

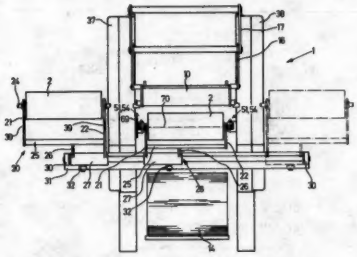
Erich Schwarzbeck, Heidelberg, Fed. Rep. of Germany, assignor to Heidelberger Druckmaschinen AG, Heidelberg, Fed. Rep. of Germany

Filed Mar. 4, 1985, Ser. No. 707,503

Claims priority, application Fed. Rep. of Germany, Mar. 2, 1984, 3407681

Int. Cl.[4] B41L *45/00*

U.S. Cl. 101—76 18 Claims



1. Device for exchanging a numbering and imprinting device having a numbering shaft for carrying numbering units thereon and provided with an associated inking unit in a printing press, for another numbering and imprinting device mounted on another numbering shaft, the exchanging device comprising a swivelling device swivellable about a horizontal pivot axis extending parallel to the axis of the numbering shaft, said swivelling device being formed of gripper elements, arranged on a cross member and carrying respective left-hand and right-hand journal pins of the numbering shaft, said horizontal pivot axis being formed by the axis of said cross-member, and said cross-member being mounted longitudinally displaceably on a carriage guide secured to a machine frame located at an end of the printing press, said carriage guide extending parallel to the axis of the numbering shaft.

4,572,070

NEEDLE-CARRYING HEAD FOR A PRINTING MACHINE

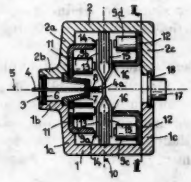
Blaise Moulin, Corcelles, Switzerland, assignor to Caracteres S.A., Neuchatel, Switzerland

Filed Jun. 18, 1984, Ser. No. 621,661

Claims priority, application Switzerland, Jun. 24, 1983, 3460/83

Int. Cl.[4] B41J *3/12*

U.S. Cl. 101—93.05 4 Claims



1. A needle carrying head for a printing machine which includes a bank of rectilinear needles the distance between which is greater than the allowable distance which may separate the respective printed points; the needles arranged in a common plane and having front and rear ends and electro-magnetic means driving each of the needles respectively; said electro-magnetic means constituting four groups of electro-magnets, said electro-magnetic means comprising a first group having members thereof disposed in front of a plane taken perpendicular to the needles and passing by the rear ends of the needles, a second group arranged in head to foot arrangement with respect to the members of the first group, members of the second group being arranged rearward of said perpendicular plane, selected ones of the first and second group forming a third group, members of which are disposed above a horizontal plane passing through the axes of the needles and selected ones of the first and second groups forming a fourth group, members of which are disposed below the said horizontal plane, levers of the first order and levers of the third order disposed for operation thereon by ones of said electro-magnet groups, those of the electro-magnets of said first and second groups which are arranged in front of the plane perpendicular to the needles being arranged to act on the needles through the intermediary of said levers of the third order type while the electro-magnet situated rearward of said perpendicular plane being arranged to act on the needles through the intermediary of said levers of the first order type.

4,572,071

DEVICE FOR GUIDING SHEETS PRINTED ON ONE OR BOTH SIDES

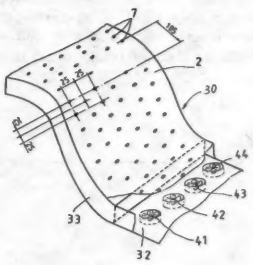
Bert Cappel, Muhlheim, and Norbert Kreuzer, Heusenstamm, both of Fed. Rep. of Germany, assignors to M.A.N.-Roland Druckmaschinen Aktiengesellschaft, Fed. Rep. of Germany

Filed Mar. 19, 1985, Ser. No. 713,444

Claims priority, application Fed. Rep. of Germany, Mar. 24, 1984, 3411029

Int. Cl.[4] B41F *5/16;* B65H *29/24*

U.S. Cl. 101—183 5 Claims

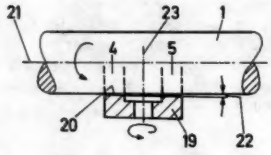


1. For use with a multicolor printing press having multiple printing units and a sheet stacker, a sheet guiding means disposed between at least one of a pair of said units and one of said units and said stacker for guiding sheets therebetween, said guiding means including a chain conveyor with sheet grippers overlying a guide surface between said units in said stacker with a plurality of air nozzles formed in the surface of said guide surface and communicating with a plurality of flow ducts, characterized in that the guide surfaces are disposed continuously and uninterruptedly between said printing units and said sheet stacker and the air nozzles take the form of apertures in the guide surfaces having a diameter of about 15 mm, the area of the apertures being from 15 to 30% of the total guide surface area, the apertures being supplied by low-pressure high-volume-flow fans disposed in the flow ducts and in that the fans are reversible so that the nozzles can be selectively supplied with air at a positive or negative pressure.

4,572,072
DEVICE FOR EXCHANGING PRINTING MEDIUM BETWEEN ZONES OFFSET WITH RESPECT TO ONE ANOTHER IN LONGITUDINAL DIRECTION OF A ROLLER IN A PRINTING UNIT OF A ROTARY PRINTING MACHINE

Willi Jeschke, Heidelberg, Fed. Rep. of Germany, assignor to Heidelberger Druckmaschinen AG, Heidelberg, Fed. Rep. of Germany

Filed Dec. 8, 1982, Ser. No. 447,949
Claims priority, application Fed. Rep. of Germany, Dec. 9, 1981, 3148667
Int. Cl.[4] B41F *31/14*
U.S. Cl. 101—348 **2 Claims**



1. Device for exchanging printing medium between zones offset with respect to one another in longtudinal direction of at least one roller in a printing unit of a rotary printing press, comprising at least one rotational body for exchanging and distributing the printing medium, said rotational body having a rotational axis out of parallel with the one roller of the printing unit and having an annular contact surface out of parallel with the axis of the one roller and contacting the one roller at least indirectly at zones thereof offset from one another, said rotational body being formed as a disc, and said annular contact surface being an end face of said disc extending substantially perpendicularly to the axis of rotation of said disc, said annular contact surface extending with angular offset in a plane disposed out of parallel with the longitudinal axis of the one roller in the printing unit so as to determine the direction of rotation of said disc, the angular offset permitting at least indirect contact between the one roller and said rotational body through the printing medium being exchanged and distributed.

4,572,073
SHEET GUIDE ARRANGEMENT IN SHEET-FED MACHINES

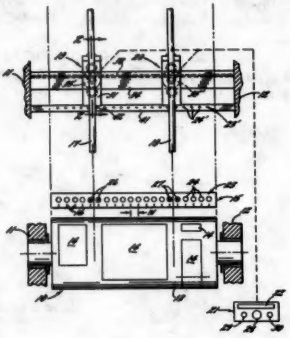
Rudolf Mitze, Dietzenbach, and Claus Simeth, Offenbach am Main, both of Fed. Rep. of Germany, assignors to M.A.N.-Roland Druckmaschinen Aktiengesellschaft, Fed. Rep. of Germany

Filed Nov. 19, 1984, Ser. No. 673,165
Claims priority, application Fed. Rep. of Germany, Nov. 25, 1983, 3342663
Int. Cl.[4] B41F *31/00*
U.S. Cl. 101—350 **20 Claims**

1. An arrangement in sheet-fed machines of the kind having lateral inking zones and laterally adjustable sheet guide means, wherein the improvement comprises

means for adjusting the lateral position of the sheet guide means from a location outside of the sheet-fed machine, and

means for sensing and displaying the lateral position of the sheet guide means in direct comparison with the lateral inking zones, so that the sheet guide means are adjustable

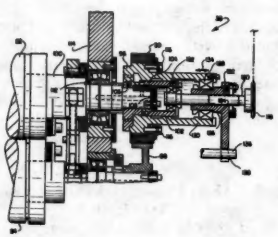


from the location outside of the sheet-fed machine to be within selected inking zones.

4,572,074
MULTI-UNIT PRESS REGISTER

Glenn A. Guaraldi, Wood River Jct., R.I., assignor to Harris Graphics Corporation, Melbourne, Fla.

Filed Nov. 14, 1984, Ser. No. 671,415
Int. Cl.[4] B41F *5/06, 5/16*
U.S. Cl. 101—426 **12 Claims**



1. A method for registering a perfecting offset printing unit to a reference perfecting offset printing unit while minimizing displacement between associated non-print gap areas, both printing units acting in succession on a web and each unit having an upper printing plate disposed around an upper print cylinder and an upper blanket disposed around an upper blanket cylinder, such combination defining an upper printing couple and each unit having a lower printing plate disposed around a lower print cylinder and a lower blanket disposed around a lower blanket cylinder, such combination defining a lower printing couple, said method comprising the steps of:

(a) monitoring the circumferential position of said upper printing plate and said lower printing plate of said unit with respect to their associated blankets;

(b) monitoring print registration between said unit and said reference unit;

(c) determining a printing position change needed for each printing couple of said unit to effect registration with said reference unit;

(d) determining circumferential bias responsive to said determined printing position changes needed and responsive to said monitored circumferential position of said printing plates of said unit;

(e) rotating said printing couples of said unit responsive to said determined circumferential bias; and

(f) circumferentially adjusting the relative position of the printing plate and blanket of at least one of said printing couples of said unit responsive to said determined circumferential bias, to the monitored printing plate position of said at least one printing couple being adjusted and to the determined printing plate position change needed for said at least one printing couple being adjusted.

4,572,075

METHODS AND APPARATUS FOR LOADING A BOREHOLE WITH EXPLOSIVES

John T. Day, Sandy, and Lex L. Udy, Holladay, both of Utah, assignors to Mining Services International Corporation, Salt Lake City, Utah

Filed Mar. 21, 1984, Ser. No. 592,306
Int. Cl.[4] F42B *3/00*
U.S. Cl. 102—313 **18 Claims**

1. A method for delivering explosive to a specified level within a borehole comprising the steps of:

obtaining a length of collapsible tubing having an input end and an open delivery end, said collapsible tubing having a diameter which is less than the diameter of the borehole;

weighting the delivery end of said tubing sufficiently to assure that the delivery end will urge the tubing toward the bottom of the borehole;

lowering the delivery end of the tubing into the borehole to the desired depth while retaining the input end of the tubing near the surface;

collapsing by water pressure at least a portion of said tubing exposed to water; and flowing explosive into the input end of the tubing and into the borehole through the open delivery end.

4,572,076

CASELESS AMMUNITION FOR AUTOMATIC WEAPONS

Anton Politzer, Lauf/Pegnitz; Werner Heberlein, Nuremberg, and Helmut Könicke, Rothenbach, Pegnitz, all of Fed. Rep. of Germany, assignors to Diehl GmbH & Co., Fed. Rep. of Germany

Filed Mar. 13, 1984, Ser. No. 589,172
Claims priority, application Fed. Rep. of Germany, Mar. 16, 1983, 3309288
Int. Cl.[4] F42B *5/18*
U.S. Cl. 102—431 **4 Claims**

1. A two part caseless ammunition for automatic weapons having a cartridge chamber in which is separately introduceable a variety of projectiles and matched propellant charges, said ammunition comprising:

a projectile body;

a propellant charge component directly attached to said projectile body and ballistically matched to said projectile body;

a base detonator fuse closely spaced from said projectile body and propellant charge, said base detonator fuse being of the same length for a single caliber size;

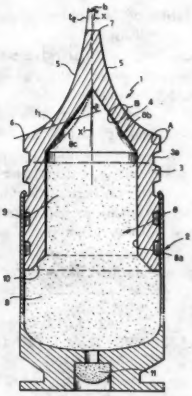
said projectile body and propellant charge forming a first part of said caseless ammunition, said base detonator fuse forming a second part of said caseless ammunition, said first and second parts being positioned adjacent and coaxial to each other within said cartridge chamber the length of said projectile body with said propellant charge attached thereto is correlated to be substantially equal to the length of said base detonator fuse for the largest overall length of said caseless ammunition and said projectile body with said propellant charge and said basse detonator fuse being of the same caliber.

4,572,077

PROJECTILE FOR HAND AND SHOULDER WEAPONS AND A CARTRIDGE FITTED WITH SAID PROJECTILE

Robert Antoine, Varennes Vauzelles, and Jacques Laurin, Nevers, both of France, assignors to Societe Francaise de Munitions, Paris, France, a part interest

Continuation of Ser. No. 415,032, Sep. 7, 1982, abandoned. This application Nov. 9, 1984, Ser. No. 670,118
Claims priority, application France, Sep. 24, 1981, 81 18499
Int. Cl.[4] F42B *5/02*
U.S. Cl. 102—439 **3 Claims**



1. A cartridge comprising a non-deformable projectile for hand and shoulder weapons having a body and a nose, said nose having a base adjacent to said body and a free end, said body being fitted into a cartridge case filled with charge powder, the longitudinal cross-section of the said nose being defined by two lines which are concave when seen from the exterior and symmetrical with respect to the axis of the projectile, the tangent to each said concave line forming with the axis of the projectile an angle which is larger near the base of the projectile nose than at the free end of said nose, the value of said angle being equal at a maximium to 90° at the base, said

body being cylindrical and being provided with an axial cavity, said cavity being open at the end remote from the projectile nose and filled at least to a partial extent with the charge powder in said cartridge case, the volume of said cavity and of said cartridge case and the mass of charge powder contained in said volumes being such that said projectile has an initial velocity which is substantially two to three times higher than that of a conventional projectile having the same caliber and fitted in the same cartridge case.

4,572,078

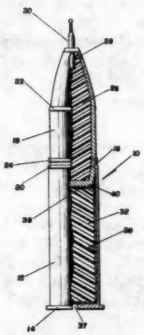
CASED CARTRIDGE AMMUNITION IGNITION BOOSTER

Frank H. Bell, Logan, Utah, assignor to Morton Thiokol, Inc., Chicago, Ill.

Continuation of Ser. No. 368,334, Apr. 14, 1982, abandoned. This application May 10, 1984, Ser. No. 608,919

Int. Cl.[4] F42B *5/26, 8/00*

U.S. Cl. 102—464 **11 Claims**



1. The combination of a cased cartridge and an ammunition ignition booster comprising,

a cartridge case for cased cartridge ammunition, said cartridge case having inside walls and an open end, and

an ignition booster for the cased cartridge ammunition comprising a film of solvent soluble nitrocellulose containing 7 to 13.6% Nitrogen applied to said inside walls of said cartridge case by pouring into said open end of said cartridge case a solvent type double-base propellant that is not cured, with the propellant containing 20–40% nitroglycerine and with acetone used as a solvent, turning the cartridge case upside down to allow the propellant to drain, and when drained, heating the cartridge case to dry the film of propellant that has adhered to said inside walls.

4,572,079

MOBILE TRACK LEVELING, LINING AND TAMPING MACHINE

Josef Theurer, Vienna, Austria, assignor to Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H., Vienna, Austria

Filed Aug. 24, 1984, Ser. No. 643,865

Claims priority, application Austria, Oct. 27, 1983, 3819/83

Int. Cl.[4] E01B *27/17*

U.S. Cl. 104—7 B **6 Claims**

1. A mobile track leveling, lining and tamping machine comprising

(a) an elongated machine frame carrying a power plant and operating control means,

(b) undercarriages supporting respective ends of the machine frame on the track for movement in an operating direction,

(c) a drive for moving the machine frame along the track,

(d) an operator's cab arranged on the machine frame at a front end and a rear end thereof at a first level,

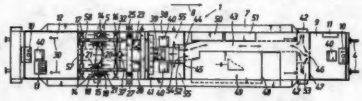
(1) the operating control means including a control for the drive in each one of the operator's cabs,

(e) a tamping tool unit mounted between the undercarriages for vertical adjustment with respect to the elongated machine frame, the tamping tool unit including

(1) power-driven pairs of reciprocable and vibratory tamping tools,

(f) a track leveling and lining unit preceding the tamping tool unit in the operating direction, the leveling and lining unit including

(1) power-driven track leveling and lining tools,



(2) the operating control means including leveling and lining reference systems controlling the track leveling and lining tools,

(g) a third operator's cab preceding the units in the operating direction and arranged within sight of the units at a level lower than the first level and between the operator's cabs at the machine frame ends, the third cab including

(1) control means for the tamping, leveling and lining tools,

(h) a connecting path leading within the elongated machine frame from the third cab to the operator's cab at the front end, said connecting path providing the sole access to the third cab, and

(i) an entry to said connecting path providing access thereto from outside the track.

4,572,080

MOVABLE STOPS FOR RAILWAY VEHICLES

Derrick G. Williams, Warwickshire; John Thurlow, Coventry, and John J. Bushnell, Warwickshire, all of England, assignors to Oleo International Holdings Limited, England

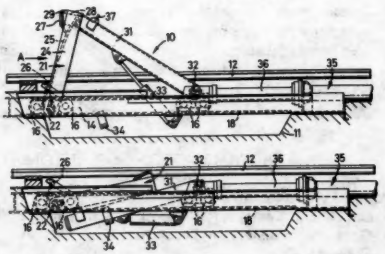
PCT No. PCT/GB84/00087, § 371 Date Oct. 16, 1984, § 102(e) Date Oct. 16, 1984, PCT Pub. No. WO84/03671, PCT Pub. Date Sep. 27, 1984

PCT Filed Mar. 19, 1984, Ser. No. 662,608

Claims priority, application United Kingdom, Mar. 18, 1983, 8307553

Int. Cl.[4] B61K *7/18*

U.S. Cl. 104—252 **13 Claims**



1. Movable buffer stop apparatus (10) for a railway vehicle on a railway track, the apparatus (10) comprising an energy absorbing device (35) which is fixed relative to the track when the apparatus (10) is installed for use, a movable stop (27), a load bearing strut and actuating means operable, when the apparatus (10) is installed for use, to move the stop (27) gener-

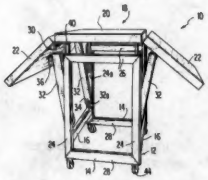
ally in the direction of the track between an operational location in which it is located in the path of a railway vehicle on the track and in which it is associated with the load bearing strut such that impact of the stop (27) by a railway vehicle moving on the track is transmitted to the energy absorbing device (35) through the load bearing strut and taken by the energy absorbing device (35) in compression, and another location in which the apparatus (10) leaves the path clear for through passage of a railway vehicle and track maintenance, characterized in that the movable stop (27), the load bearing strut (31), and the actuating means are mounted on a truck (14) which, when the apparatus (10) is used, runs on a track which is sunken relative to the railway track, the truck (14) coacting with the energy absorbing device (35) so that energy transmitted to the truck (14) through the strut (31) as a result of impact of the stop (27) by a railway vehicle moving on the railway track is absorbed by the energy absorbing device (35), and the actuating means are operable to move the stop (27) into its operational location by moving the strut (31) into a position in which it transmits impact forces to the truck (14) in compression without the actuating means being loaded by those forces.

4,572,081

CONVERTIBLE DINING TABLE AND WORK COUNTER

Timothy E. Copeland, Star Rte., P.O. Box 386, Corinth, Vt. 05033

Filed Dec. 1, 1982, Ser. No. 445,782
Int. Cl.⁴ A47B *85/00*
U.S. Cl. 108—17 **4 Claims**



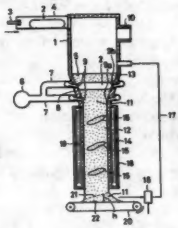
1. A convertible dining table and work counter comprising:
a tabletop,
a table base underlying said tabletop,
said base including longitudinally spaced laterally separated paired vertical risers,
a laterally extending crosspiece joining paired vertical risers at each end and underlying said tabletop,
said tabletop comprising a center panel of a width generally corresponding to the base and extending longitudinally thereof with its ends overlying lateral crosspieces,
end leaves edge hinged to the center panel along the side edges of the center panel so as to pivot vertically downwardly from the side edges of the center panel,
conversion levers hinged at one end to the base and having the other end hinged to the end leaves at positions outwardly of the hinge connection of said end leaves to said center panel, the hinge connections of the conversion levers and the length of said conversion levers being such that with the end leaves extending generally vertically downwardly from the side edges of the center panel, the center panel is raised above the crosspiece to counter height, and wherein by pivoting the end leaves coplanar to the center panel, the center panel is lowered onto the crosspieces to provide an increased tabletop surface area at reduced table height, and guide means for permitting vertical raising and lowering of the center panel while preventing lateral and longitudinal movement of the center panel relative to the base.

4,572,082

THERMAL DECOMPOSITION FURNACE OF WASTE TIRES

Yoshihiko Ueda, Chiba; Ikuo Saito, Tokyo; Kazumasa Sakae, Yachiyo, and Tetuo Oogiri, Tokyo, all of Japan, assignors to Onoda Cement Co., Ltd., Japan

Continuation of Ser. No. 689,461, Jan. 7, 1985, which is a continuation of Ser. No. 557,332, Dec. 2, 1983, abandoned. This application Jun. 3, 1985, Ser. No. 740,534
Int. Cl.⁴ F23G *5/00*
U.S. Cl. 110—245 **8 Claims**



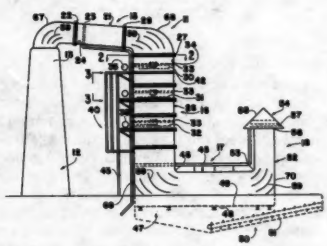
1. A furnace for thermally decomposing waste tires comprising:
an upper bed-forming section having lateral dimensions larger than the outer diameter of a waste tire;
a vertically elongated lower bed-forming section having an open lower end and lateral dimensions smaller than the lateral dimensions of said upper section and smaller than the outer diameter of a waste tire, said lower section being positioned below and in communication with said upper section and forming a tire decomposition chamber;
granular media disposed within said upper and lower sections forming a continuous column of granular media;
means for fluidizing the media within said upper section;
means for withdrawing media from the bottom of said lower section;
means for returning withdrawn media to said upper section; and
whereby whole waste tires can be individually fed into said fluidized media in said upper section and thermally decomposed as they move downwardly through said column of granular media.

4,572,083

COMBUSTION GAS CLEANING SYSTEM

Arval H. Griffith, 424 First Ave. S., Greybull, Wyo. 82426

Filed May 16, 1985, Ser. No. 734,859
Int. Cl.⁴ F23J *15/00*
U.S. Cl. 110—215 **17 Claims**



1. Combustion gas cleaning system including a transferring portion, a treating portion, an impurity collecting portion, an exhaust portion and a liquid purifying portion; said transferring

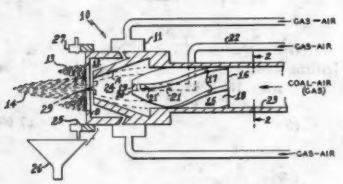
portion including a substantially horizontal first duct member, said first duct member having one end communicating with a smokestack, said first duct member being inclined downwardly slightly from said smokestack, first spray means located around the inside periphery of said first duct member intermediate the length thereof and directed toward the axis thereof; said treating portion including an elongated substantially vertical chamber, the top of said chamber communicating with an end of said first duct member remote from said smokestack, said chamber having a generally circular cross section, a plurality of spaced fan members disposed within said chamber transversely along the length thereof, second spray means disposed adjacent each fan member, said second spray means being disposed around the internal periphery of said chamber and directed toward the axis thereof, each of said fan members being operatively connected to drive means located outside said chamber; said impurity collecting portion including a second horizontal duct member extending from the lower end of said chamber, a liquid reservoir disposed below said second duct member and communicating therewith through a plurality of openings in the bottom of said second duct member, the liquid level in said second duct member reducing the cross-sectional area thereof to an area more than one-half that of said chamber cross section, solids removal means disposed within said liquid reservoir; said exhaust portion including a generally vertically oriented third duct member extending upwardly from an end of said second duct member remote from said chamber, an exhaust deflecting section disposed on the upper end of said third duct member, third spray means located outside said third duct member adjacent said deflecting section; said liquid purifying portion including liquid receiving means communicating with said liquid reservoir and liquid recirculating means to said spray means of said chamber and said duct members; whereby impurities in combustion gases passing through said chamber are removed by said spray means and are collected in said liquid reservoir.

4,572,084

METHOD AND APPARATUS OF GAS-COAL COMBUSTION IN STEAM BOILERS

Alex E. S. Green, Gainesville, and Bruce A. S. Green, Micanopy, both of Fla., assignors to University of Florida, Gainesville, Fla.

Continuation of Ser. No. 306,177, Sep. 28, 1981, abandoned. This application Jun. 2, 1983, Ser. No. 500,394
Int. Cl.⁴ F23C *1/10*
U.S. Cl. 110—261 **41 Claims**



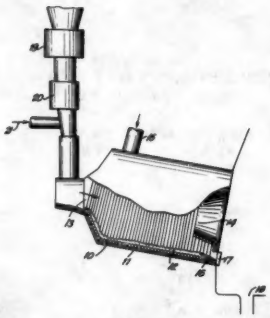
1. In a combustion device for burning a powdered coal-fluid mixture comprising a combustion chamber, first nozzle means communicating with said chamber for spirally swirling said coal-fluid mixture along a path in said chamber to form a hollow sheath of coal-fluid mixture, second nozzle means communicating with said chamber and located generally centrally of said hollow sheath for spirally swirling combustible gas-air mixture in said chamber and within said sheath of coal-fluid mixture in the same direction of swirl to reinforce the swirling motion of said coal-fluid mixture forming said sheath without general mixing therebetween and to promote volatilization and enhance the combustion of said coal-fluid mixture, means for burning said coal-fluid mixture and said gas-air mixture within said chamber, first supply means fluidly communicating with said first nozzle means for providing coal-fluid mixture to said first nozzle means and said chamber, second supply means fluidly communicating with said second nozzle means for providing gas-air mixture to said chamber, said second nozzle means including an elongated insert having upstream and downstream end portions, said downstream end portion of said insert being adjacent said second supply means, a plurality of spaced generally spiral channels in the outer surface of said insert extending from said upstream end portion and terminating in said downstream end portion, said channels communicating between said second supply means and said chamber for spirally swirling said gas-air mixture prior to egressing from said second supply means into said chamber.

4,572,085

COAL COMBUSTION TO PRODUCE CLEAN LOW-SULFUR EXHAUST GAS

Malcolm T. Hepworth, Golden, Colo., assignor to Amax Inc., Greenwich, Conn.

Filed Feb. 6, 1985, Ser. No. 698,705
Int. Cl.⁴ F23J *11/00, 15/00*
U.S. Cl. 110—345 **9 Claims**



1. The process for combusting sulfur-containing coal while producing an off-gas low in sulfur which comprises combusting finely divided coal in a furnace burner cavity in the presence of a finely divided iron-containing material from the group consisting of iron oxide and iron powder and at least about 60% of the oxygen stoichiometrically required for complete combustion of the coal to provide a turbulent atmosphere of combustion-product gases having a temperature of at least about 1100° C. wherein the principal sulfur-containing phase formed by combustion of said coal is hydrogen sulfide and said iron-containing material forms a liquid iron oxysulfide phase filling said burner cavity with a cloud of liquid scrubbing medium particles, said liquid iron oxysulfide acting to scrub sulfur-containing gaseous species from said atmosphere to yield an essentially sulfur-free flue gas and a liquid iron oxysulfide slag containing essentially all the sulfur originally contained in said coal.

4,572,086

FINE FUEL DELIVERY SYSTEM WITH REMOTE DRYING AND ON SITE STORAGE

Max A. Ladt, and Carroll H. Ladt, both of Paducah, Ky., assignors to Convenient Energy, Inc., Paducah, Ky.

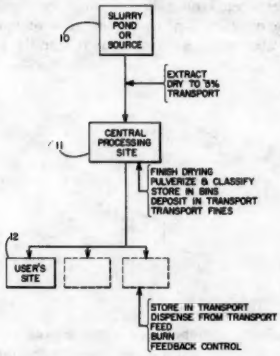
Filed Oct. 27, 1983, Ser. No. 546,033
Int. Cl.⁴ F23D *1/00*
U.S. Cl. 110—347 **18 Claims**

1. A fine fuel delivery system comprising:

initial drying means located at a source of fuel and operable to receive moist fuel and to initially dry same to a moisture content less than fifteen percent;

pulverizing and final drying means located at a site other than at said source of fuel and operable to receive initially

dried fuel and to pulverize and final dry same producing dried fine fuel; and,



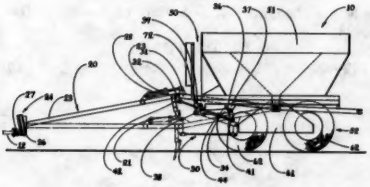
transport and storage means operable to receive said dried fine fuel, to transfer same to the site of the end user and to hold and store same at the site of the end user as said dried fine fuel is withdrawn therefrom and fed to a burner.

4,572,087

FERTILIZER INJECTION APPARATUS

J. Phillip Brannan, 11834 Chicago Pl., Omaha, Nebr. 68154

Filed Dec. 31, 1984, Ser. No. 687,994
Int. Cl.⁴ A01C *5/00*
U.S. Cl. 111—56 **20 Claims**



1. An apparatus for injecting fertilizer into the ground, comprising:

a hollow, ground-piercing knife mounted on a tool bar, said tool bar having a hitch-bearing tongue for pivotal connection to a tractor means;

a dry fertilizer hopper means pivotally supported on a single axle, said axle being supported above the ground by wheel means rotatably connected thereto;

means for injecting dry fertilizer from said hopper, to the hollow portion of said ground piercing knife and out of a port in said hollow portion into the ground;

a first rigid link means rotatably connected at one end about said single axle and pivotally connected at its other end to said tool bar about an axis parallel to said axle;

means for controlling the angle between said tool bar and said first rigid link;

a bell crank lever means pivotally connected to said first rigid link means and having means for pivotally connecting one leg to a second rigid link means which is pivotally connected at its other end to said hopper and means for pivotally connecting its other leg to a third rigid link means which is pivotally connected at its other end to said tool bar; and

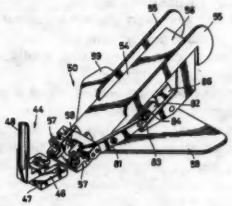
wherein the fore and aft length of said tool bar, the length of said first rigid link means, the length of the legs of said bell crank lever means, the angle between the legs of said bell crank lever means, the location of where said bell crank lever means is pivotally connected to said first rigid link means, the length of said second rigid link means, the location of where said second rigid link means is pivotally connected to said hopper means, the length of said third rigid link means, and the location of where said third rigid link means is pivotally connected to said tool bar, are all such that the angular relationship of said hopper with respect to the ground under it remains substantially constant as the angle between said tool bar and said first rigid link means is changed.

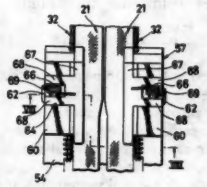
4,572,088

DEVICE FOR GUIDING CONCEALED SLIDE FASTENER STRINGERS TO A SEWING MACHINE

Yasuhiko Matsuda, Toyama, Japan, assignor to Yoshida Kogyo K.K., Tokyo, Japan

Filed Mar. 6, 1985, Ser. No. 708,852
Claims priority, application Japan, Mar. 6, 1984, 59-32796; Mar. 6, 1984, 59-32797
Int. Cl.⁴ D05B *3/12, 33/02*
U.S. Cl. 112—104 **8 Claims**





1. A device for guiding a concealed slide fastener stringer having an element assembly including coupling elements with coupling heads to a sewing machine having a sewing position, comprising:

(a) a guide plate defining a path for feeding the concealed slide fastener stringer therealong toward the sewing position;

(b) a track body mounted on said guide plate in said path and comprising a block fixedly mounted on said guide plate and a cover member movably mounted on said block; and

(c) said block and said cover member jointly defining a guide channel for guiding the element assembly therethrough while the concealed slide fastener stringer is fed along said path toward the sewing position, said guide channel including a recess for accommodating the coupling heads at an inlet end thereof, said recess being shaped for automatically erecting said element assembly from a horizontal position to a vertical position as the element assembly is moved progressively through said guide channel.

4,572,089

EDGE TRIMMER FOR SEWING MACHINE

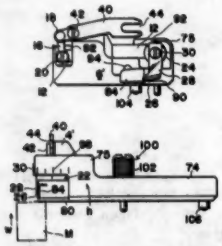
Naoichi Nishi, Sanjo, Japan, assignor to Nishi Manufacturing Co., Ltd., Niigata, Japan

Continuation-in-part of Ser. No. 495,396, May 11, 1983, abandoned. This application Apr. 2, 1984, Ser. No. 595,833

Claims priority, application Japan, Jun. 16, 1982, 57-089960[U]

Int. Cl.[4] D05B *37/06*

U.S. Cl. 112—128 2 Claims



1. An edge trimmer for a sewing machine having a needle fastened to a needle bar by a clamping screw, said edge trimmer comprising:

a base;

a stand integrally formed on the base;

a lower lever being pivotably supported about a midportion thereof by the stand and having two ends;

a link being connected at one end to one of the two ends of the lower lever;

an upper lever pivotably supported about a point between two ends thereof by the stand, said upper lever being connected at one end to an opposing end of the link and being connected at an opposite end to the clamping screw of the needle bar;

a cylindrical arm projecting from the other end of the two ends of the lower lever;

a cutter depending at one end from one end of the cylindrical arm and having a shearing edge at an opposite end for cutting cloth;

means, secured to the base, for guiding cloth into contact with the cutter;

a shearing plate being secured to the base and having a shearing edge;

means, included in the cylindrical arm, for adjusting contact between the shearing edge of the cutter and the shearing edge of the shearing plate; and

cover plate means, secured to the base, for protectively extending around the cylindrical arm by leaving a clearance therebetween, said cover plate means having scale marks graduated in equal increments along the front edge thereof;

whereby, whenever cloth is shifted by the guide means, an operator of the sewing machine is able to adjust the width of a trimming edge of the cloth after viewing the scale marks along the front edge of the cover plate means.

4,572,090

SNAP FIT WORKPIECE EDGE GUIDE FOR A SEWING MACHINE

Susumu Hanyu; Akio Koide, both of Tokyo, and Koji Kanemaki, Fukui, all of Japan, assignors to Janome Sewing Machine Industry Co., Ltd., Japan

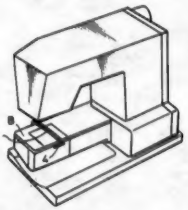
Filed Dec. 13, 1984, Ser. No. 681,360

Claims priority, application Japan, Dec. 15, 1983, 58-192149[U]

Int. Cl.[4] D05B *35/10*

U.S. Cl. 112—153 2 Claims

1. A fabric guide used in combination with a sewing machine having a sewing machine bed of a predetermined width, said fabric guide comprising a main body in a form of an elongated plate made of an elastic material and having opposite faces vertically extended all through the length of said elongated plate, said elongated plate having hook portions integrally formed at the opposite ends lengthwise thereof and terminated in opposite abutments each extended laterally thereof, and



normally defining therebetween a predetermined distance a little smaller than the width of said sewing machine bed, said hook portions being operated against the elastic action thereof to enlarge said distance between said opposite abutments to thereby install said fabric guide on said sewing machine bed across said width thereof.

4,572,091

FREELY REVOLVING LOOPER FOR DOUBLE LOCKSTITCH SEWING MACHINES

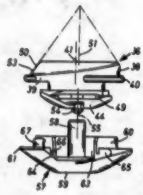
Kurt Gustmann, Kaiserslautern; Siegard Brandt, Stelzenberg, and Ludwig Sourisseaux, Ramstein-Miesenbach, all of Fed. Rep. of Germany, assignors to Pfaff Aktiengesellschaft, Fed. Rep. of Germany

Filed Nov. 18, 1983, Ser. No. 553,065

Claims priority, application Fed. Rep. of Germany, Dec. 4, 1982, 3244946

Int. Cl.[4] D05B *57/26*

U.S. Cl. 112—229 1 Claim



1. A rotary hook for a sewing machine having a rotary hook drive shaft for driving a rotary hook body in cooperation with a reciprocating reciprocatig needle which moves toward and away from the rotary hook in a needle movement plane, comprising:

a rotary hook body having a revolving hook tip movable in a path below the needle and engageable with a thread presented by the needle to catch a needle thread loop, said path having an upwardly directed portion near the needle and a downwardly directed portion away from the needle, said rotary hook body having a thread deflecting shoulder for forming the needle loop and having an annular groove defined therein;

a bobbin case holder having an annular guide rib disposed in said annular groove of said rotary hook body for supporting said bobbin case holder on said rotary hook body;

a pin extending axially outwardly from said bobbin case holder;

a bobbin case having a central hollow sleeve into which said

pin extends and onto which a bobbin having a pair of axially spaced flanges is rotatably receivable;

means for holding said bobbin case holder against rotation;

said bobbin case and said case holder together having an axial length so that the plane of movement of the needle extends between flanges of a bobbin rotatably received on said hollow sleeve;

said case holder and said bobbin case having annular side walls which are in substantial axial alignment with each other and which engage each other to form a space for a bobbin received on said hollow sleeve;

said bobbin case holder having a rear wall closing said space, said bobbin case holder side wall connected to said rear wall and at least partly having the shape of a truncated cone which is eccentric with respect to said guide rib, an axis of said truncated cone and an axis of said pin lying below and laterally of an axis of said guide rib on one side of the upwardly directed portion of the path of said hook tip;

said bobbin case having its annular side wall extending toward said case holder from said needle movement path, and having a front end wall for closing said space which has an arched mushroom shape, said front end wall having a peripheral annular edge portion which extends axially to the plane of movement of the thread deflecting shoulder of said rotary hook body which plane of movement lies on a side of said needle movement plane closest to said rotary hook body, said bobbin case front end wall comprising a cap having a recess concentric with said sidewall of said bobbin case and a thread tensioning spring in said recess.

4,572,092

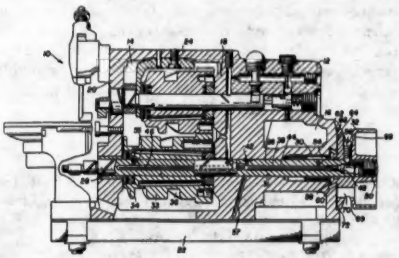
HANDWHEEL MODIFIED FOR IMPROVED LUBRICATION AND COOLING

George B. Armstead, Jr., Glastonbury, Conn., assignor to The Merrow Machine Company, Newington, Conn.

Filed Sep. 21, 1983, Ser. No. 534,516

Int. Cl.[4] D05B *71/00*

U.S. Cl. 112—256 **9 Claims**



1. In a sewing machine which has a housing, a mechanism which has sewing elements and drive means for the sewing elements, said drive means including a shaft which is rotatable in said housing, a bearing in said housing for rotatably supporting said shaft, means for supplying lubricant to said bearing, a wheel mounted on said shaft for rotation therewith, said wheel being located outside said housing, said wheel and said housing having substantially continuous surfaces which are in close proximity to each other to provide a thin space between said wheel and said housing, said space being sufficiently thin and the rotation of the shaft being such that, in the absence of the improvement recited below, the rotation of said wheel is operable to reduce the pressure near the center of the space so that lubricant is aspirated from within the housing,

the improvement wherein the wheel is provided with means for preventing the aspiration of lubricant from the housing, said means for preventing such aspiration being an opening means formed in the wheel for supplying atmospheric air to said space.

4,572,093

LUBRICATING SYSTEM FOR SEWING MACHINES

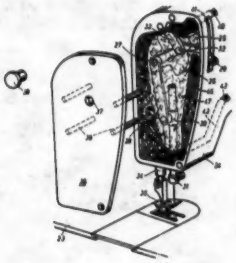
Herbert Wenz, and Dietmar Becker, both of Kaiserslautern, Fed. Rep. of Germany, assignors to Pfaff Industriemaschinen GmbH, Fed. Rep. of Germany

Filed Jan. 13, 1984, Ser. No. 570,499

Claims priority, application Fed. Rep. of Germany, Feb. 24, 1983, 3306414

Int. Cl.[4] D05B *71/00*

U.S. Cl. 112—256 **11 Claims**



1. A method of establishing a lubricating system for operating machines, particularly in sewing machines, for lubricating bearing points within the sewing machine housing, comprising directing, while the sewing machine is running, a predetermined amount of fiber cuts of a material having satisfactory absorbtive capacity and matting property into the housing to cause the formation of a felt cushion which becomes positively held in the housing and conforms to the paths of motion of the moving parts, and sprinkling the fiber cuts with oil.

4,572,094

SEWING MACHINE WITH WORKPIECE DIFFERENTIAL TRANSPORT DEVICE

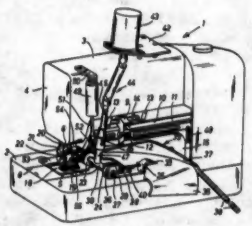
Hermann Taddicken, Schwäbisch-Gmünd, Fed. Rep. of Germany, assignor to Elsele Apparate-und Gerätebau GmbH, Fed. Rep. of Germany

Filed Sep. 17, 1984, Ser. No. 651,604

Claims priority, application Fed. Rep. of Germany, Sep. 17, 1983, 8326790[U]

Int. Cl.[4] D05B *27/16*

U.S. Cl. 112—322 **8 Claims**



1. An indexing device for moving a workpiece along a draw-off path to a plurality of sewing positions at spaced intervals in a sewing machine for the forming of stitch groups at the positions, such as a row of buttonholes, which stitch groups are sewn by a reciprocating needle of the sewing machine operating on the workpiece as it is advanced through the draw-off

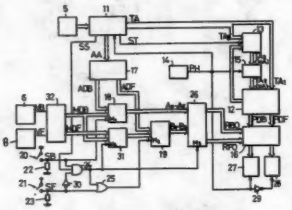
path, comprising a draw-off roller disposed alongside the needle, first transport means spaced laterally from said draw-off roller, second transport means offset laterally and rearwardly in the draw-off path from said first transport means, and drive means connected to said draw-off roller, said first transport means and said second transport means to drive them in synchronism.

4,572,095

ELECTRONIC SEWING MACHINE

Hachiro Makabe, Kanagawa, and Takeshi Kongoh, Tokyo, both of Japan, assignors to Janome Sewing Machine Industry Co., Ltd., Japan

Filed Mar. 30, 1984, Ser. No. 595,144
Claims priority, application Japan, Apr. 1, 1983, 58-55045
Int. Cl.[4] D05B *3/02*
U.S. Cl. 112—456 **3 Claims**



1. An electronic sewing machine comprising, in combination,

a first electronic memory storing stitch control data for a plurality of stitch patterns which are selectively read out for controlling needle lateral amplitude and fabric feeding amount per stitch of a selected pattern;

a second electronic memory storing auto-data which are each specific to each of the patterns stored in said first memory for automatically acting on each data of the selected pattern, thereby determining the optimum size of the pattern;

first means for detecting if the selected pattern is proportionally variable, which in the affirmative produces an address signal for reading out the initial stitch control data of the selected pattern from said first memory and another address signal for reading out an auto-data specific to the selected pattern from said second memory;

second means manually operated to produce first and second signals for modifying the stitch control data for the needle lateral amplitude and fabric feeding amount respectively, said second means including first and second switches being selectively operated to make effective said first and second signals and said auto-data;

third means operated in association with a first state of said first and second switches to make effective said auto-data read out from said second memory, said third means operated in association with a second state of said first and second switches to make effective one of said first and second signals;

calculating means receiving said stitch control data of said selected pattern from said first memory, said calculating means receiving said auto-data from said third means when said first and second switches are in said first state and calculating said stitch control data with said auto-data to produce a first set of modified data for producing a standard size of a selected pattern, said calculating means receiving said one of said first and second signals when said first and second switches are in said second state and calculating said stitch control data with said one signal to produce a second set of modified data for producing a proportionally reduced size of said selected pattern; and

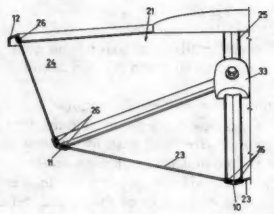
drive means operated in response to said modified stitch control data supplied from said calculating means to control the needle lateral amplitude and the fabric feeding amount.

4,572,096

BOAT CONSTRUCTION

David E. Payne, Villa 133, Captain John Fripp's Villas, Fripp Island (Beaufurt), S.C. 29901

Continuation-in-part of Ser. No. 356,371, Mar. 9, 1982, abandoned. This application Feb. 9, 1984, Ser. No. 578,565
Claims priority, application Australia, Mar. 10, 1981, PE7933
Int. Cl.[4] B63B *3/00*
U.S. Cl. 114—88 **39 Claims**



1. A method of contructing a vessel, comprising:

(a) producing a constant cross-sectional shaped joining strip having facing surfaces defining a slot and a rib within the slot forming an abutment,

(b) deforming a sheet of material near one edge thereof to provide a retaining surface projecting from one face of the sheet,

(c) inserting the deformed edge of the sheet into the slot and locating the retaining surface adjacent the abutment,

(d) inserting a key into the slot to bear against the other face of the sheet thereby maintaining engagement of said retaining surface with said abutment, and

(e) clamping the end of said strip and portions of said sheet adjacent the end with a pair of clamping means by urging one of each pair into surface-to-surface engagement with inner surfaces of said strip and sheet and the other of each pair into surface-to-surface engagement with outer surfaces of said strip and sheet so as to thereby firmly close and clamp the strip end against the sheet and the key.

4,572,097

OIL LEVEL DETECTOR

Orest Chapelsky, Ann Arbor, Mich., assignor to Jere R. Lansinger, Bloomfield Hills and Bohdan W. Fedorowycz, Livonia, both of, Mich.

Filed Oct. 14, 1983, Ser. No. 541,894
Int. Cl.[3] G01F *23/04, 23/00;* H01H *35/38;* G08B *21/00*
U.S. Cl. 116—227 **11 Claims**

1. For use with a liquid system having a reservoir, a device for detecting when a liquid in the reservoir falls below a predetermined level comprising:

a housing defining a chamber,

means for fluidly connecting said housing chamber to said reservoir,

a plate having a port, said plate dividing said housing chamber into an upper elongated chamber and lower chamber,

a piston slidably mounted in said upper chamber and movable between a first position in which said piston is adjacent said plate and a second position in which said piston is adjacent an end of said upper chamber spaced from said plate,

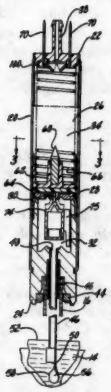
means for urging said piston towards said first position,

means for continuously cyclically urging said piston towards said second position, said cyclical urging means compris-

ing a cyclical vacuum source continuously fluidly connected to said end of said upper chamber,

means for indicating when said piston is at said second position, and

means for closing said port when said liquid is at or above said predetermined level so that with said port closed,



travel of said piston toward said second position creates a partial vacuum in said lower chamber which prevents said piston from reaching said second position and so that, when said liquid is below said predetermined level, said port remains open to prevent the formation of a partial vacuum in said lower chamber.

4,572,098

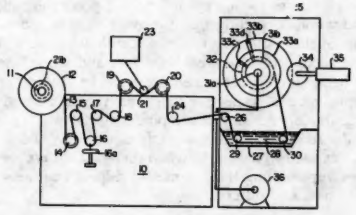
LIQUID SMOKE-IMPREGNATION OF FIBROUS FOOD CASINGS

Herman S. Chiu, Chicago, Ill., assignor to Union Carbide Corporation, Danbury, Conn.

Division of Ser. No. 301,276, Sep. 11, 1981, Pat. No. 4,377,606. This application Sep. 8, 1982, Ser. No. 415,862

Int. Cl.⁴ B05C *3/12, 5/00, 11/02*

U.S. Cl. 118—33 **13 Claims**



1. Apparatus suitable for manufacturing a wood derived liquid smoke impregnated cellulosic casing, said apparatus comprising:

(a) a first rotatable unwind shaft adapted to have mounted thereon a feed roll of cellulosic casing in flat web form, said roll of casing being engaged on said first shaft;

(b) tension dancer roll means to control the tension on said casing as it contacts said casing;

(c) an unwind roll brake co-acting with said first unwind shaft and controlled by a dancer roll-operated regulator at said tension dancer roll, said brake providing a restraining torque on said unwind shaft;

(d) edge guiding means adapted to edge-align the casing for transfer of said casing to a liquid smoke contacting means;

(e) a second rotatable rewind shaft mounted with a roll core for withdrawing said casing from said liquid smoke contacting means and for rewinding said casing on said roll core;

(f) side plates mounted on said second rotatable shaft to provide edge guidance and alignment of succeeding casing layers during rewinding of said casing;

(g) means to spin the rewound roll of casing when the feed roll is spent; and,

(h) a rider squeeze roll adapted to be moved into edge-to-edge contact with said casing during the spinning of said casing.

4,572,099

APPARATUS FOR SELECTIVE ONE AND TWO-SIDED COATING OF ENDLESS STRIPS OF SHEET STOCK

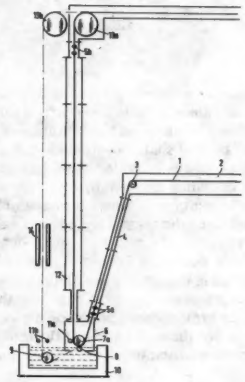
Rolf Michel, Drensteinfurt, and Klaus Fromman, Meerbusch, both of Fed. Rep. of Germany, assignors to Mannesmann AG, Duesseldorf, Fed. Rep. of Germany

Filed Apr. 9, 1984, Ser. No. 598,012

Claims priority, application Fed. Rep. of Germany, Apr. 13, 1983, 3313218

Int. Cl.⁴ B05C *1/08, 3/12*

U.S. Cl. 118—68 **2 Claims**



1. Apparatus for selective one-sided and two-sided coating of a continuous running strip or sheet, there being a protective gas filled feeder duct, and a coating material filled container underneath, further comprising;

a first deflection roll mounted for rotation about a horizontal axis, the strip to be coated partially looping around said roll;

a scooping roll disposed underneath said deflection roll and mounted also for rotation on a horizontal axis further situated to flush scooped liquidous coating material against that surface of the strip or sheet facing away from the deflection roll about which it is looped;

a casing open at the bottom and sealingly connected to said feeder duct and being gas tight but closed at the bottom of the coating material and containing said deflection and scooping rolls;

a basically closed, first cooling path and duct containing protective gas and being connected to said casing, said strip or sheet when running off said deflection roll running into and through said cooling duct;

a second deflection roll immersed in and said bath for selectively receiving and deflecting said strip, said strip or sheet when running off said second deflection roll running

through a second, basically open atmospheric cooling path; and

means for directing said strip or sheet from said first and second cooling paths into a common output and exit path.

4,572,100

APPARATUS FOR MOISTENING LOOSE MATERIAL

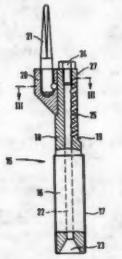
Wilhelm Schlüter, Altenbeken, Fed. Rep. of Germany, assignor to Gebruder Lodige Maschinenbau-Gesellschaft mbH, Paderborn, Fed. Rep. of Germany

Division of Ser. No. 415,679, Sep. 7, 1982. This application Feb. 21, 1985, Ser. No. 703,743

Claims priority, application Fed. Rep. of Germany, Sep. 18, 1981, 3137109

Int. Cl.⁴ B05B *17/00*

U.S. Cl. 118—303 **5 Claims**



1. Apparatus for moistening loose material, the apparatus comprising a container, a hollow shaft rotatably and drivably mounted in the container, and a plurality of rod-like tools secured to the hollow shaft, wherein each rod-like tool is of cylindrical shape and is provided with a central longitudinal bore one end of which opens into the hollow shaft and the other end of which is closed, wherein each tool has a longitudinally-extending flat external surface portion and a plurality of substantially radial bores communicating with said central longitudinal bore, the radial bores terminating at the external surface of the tool in the zone of said flat portion, the apparatus being such that a moistening agent can flow through the hollow shaft and be broken down into droplets as the moistening agent is flung out of the radial bores of the tools by the centrifugal force caused by rotation of the hollow shaft.

4,572,101

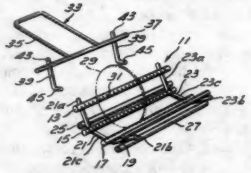
SIDE LIFTING WAFER BOAT ASSEMBLY

Steven N. Lee, Irvine, Calif., assignor to ASQ Boats, Inc., Tustin, Calif.

Continuation-in-part of Ser. No. 494,171, May 13, 1983, Pat. No. 4,515,104. This application Aug. 13, 1984, Ser. No. 641,170

Int. Cl.⁴ B05C *13/02*

U.S. Cl. 118—500 **15 Claims**



1. A side lifting wafer boat assembly adapted for detachable, mutual engagement along the length of a boat to lift the boat from a boat supporting surface, said assembly comprising:

a boat shaped to receive a plurality of wafer disks, disposed in spaced parallel relation perpendicular to the length of said boat, a first boat member extending along the length of said boat, and a second boat member extending along at least a portion of the height of said boat; and

a tool adapted for detachable lateral engagement to said boat along the length thereof, said tool comprising a handle projecting externally from the side of the boat upon engagement of tool to the boat, a first boat engaging member adapted to bear against one of said boat members to form a lift contact joint to support the weight of said boat, and a second boat engaging member adapted to be locatable to bear against the other of said boat members to form a rotation contact joint to impede rotation of said boat about said lift contact joint.

4,572,102

METHOD OF CONTROLLING REPLENISHMENT OF TONERS

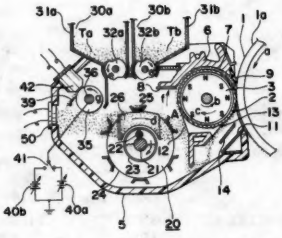
Shizuo Yuge, Toyokawa; Tateki Oka, Toyhashi; Susumu Sakakibara, Toyohashi, and Naoki Toyoshi, Toyohashi, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Mar. 6, 1984, Ser. No. 586,762

Claims priority, application Japan, Mar. 17, 1983, 58-45575

Int. Cl.⁴ G03G *15/00*

U.S. Cl. 118—689 **8 Claims**



1. A method of controlling replenishment of toners in a developing material including two kinds of toners triboelectrically chargeable to polarities opposite to each other, said toner replenishment control method comprising the steps of causing the respective toners contained in said developing material to separately adhere to each of first and second surface areas of a detecting member having predetermined potentials, obtaining first and second detecting signals substantially proportional to amounts of the respective toners which have adhered to said first and second surface areas, said first and second detected signals being initially set to become equal to each other when the mixing ratio of respective toners having the desired developing characteristics in a developing material is at a predetermined desired mixing ratio, directly comparing said first and second detected signals, and, when there is a difference therebetween, replenishing the one of said respective toners which will eliminate said difference.

4,572,103

SOLDER PASTE DISPENSER FOR SMD CIRCUIT BOARDS

Harold J. Engel, 18932 Olympia St., Northridge, Calif. 91326

Filed Dec. 20, 1984, Ser. No. 684,282

Int. Cl.⁴ B05C *5/02*

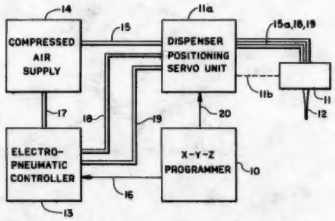
U.S. Cl. 118—697 **18 Claims**

1. A system for the deposition of a viscous fluid in small quantities at each of a plurality of X-Y-Z locations with respect to a surface, comprising:

a dispensing device including an axially translating dispensing piston slideably located within a guiding passage ending in an orifice directed toward said surface;

first means comprising a feed passage communicating laterally with said guiding passage, said feed passage having a greater cross-sectional area than that of said guiding passage;

second means within said guiding passage comprising an enlargement of said guiding passage at the point of communication of said feed passage;



third means for supplying said viscous fluid to said enlargement under pressure through said feed passage; and

fourth means for causing said piston to translate through and beyond said enlargement to effect ejection of a discrete quantity of said viscous fluid from the orifice of said needle.

4,572,104

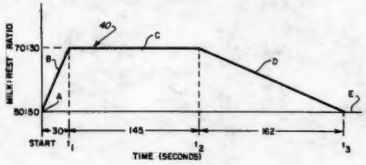
METHOD OF MILKING

Daniel A. Rubino, Oak Brook, Ill., assignor to Babson Bros. Co., Oak Brook, Ill.

Continuation-in-part of Ser. No. 557,251, Dec. 1, 1983, abandoned. This application Apr. 4, 1985, Ser. No. 720,049

Int. Cl.⁴ A01J *5/04*

U.S. Cl. 119—14.02 **33 Claims**



1. In a double action milking system having an apparatus for connection with a cow's teats to apply a continuous vacuum to the end of the teat to remove milk therefrom and for establishing alternate time periods of release and squeeze of the teat to allow milk to flow and to provide for rest respectively, the method of operation comprising the steps of:

milking at a first selected ratio of milk period to rest period; and

thereafter gradually decreasing the ratio of the milk period to the rest period to a second selected ratio.

4,572,105

BACKFLUSHING SYSTEM

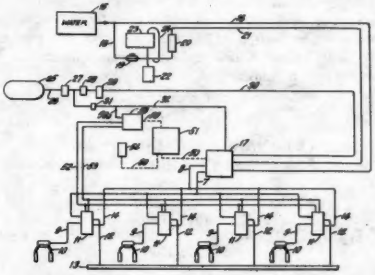
Mofazzal H. Chowdhury, and Michael W. Ellis, both of Kansas City, Mo., assignors to Alfa-Laval, Inc., Fort Lee, N.J.

Filed Sep. 20, 1984, Ser. No. 652,517

Int. Cl.⁴ A01J *7/00*

U.S. Cl. 119—14.18 **9 Claims**

7. The backflush system for a milking machine having a milking unit delivering milk from animals being milked to a milk line, comprising a backflush valve, for alternately connecting the milking unit to the milking line and to a wash line, means for delivering, individually, during preselected periods over a predetermined interval, water, sanitizing fluid and air to said wash line and thence to said backflush valve when said backflush valve is connected to said wash line and means for



flushing said backflush valve with water at the end of said predetermined interval.

4,572,106

TEAT CUP MILKING INFLATION OR LINER

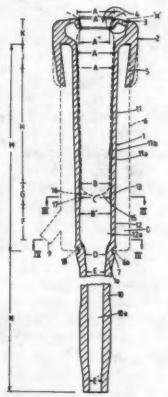
Geoffrey S. Mills, 3 Olympia Pl., Hamilton, New Zealand

Filed Dec. 4, 1984, Ser. No. 677,840

Claims priority, application New Zealand, Dec. 21, 1983, 206657

Int. Cl.⁴ A01J *5/08*

U.S. Cl. 119—14.47 **6 Claims**



1. A teat cup milking inflation of the kind referred to and comprising a resilient upright substantially cylindrical tubular body part arranged to be located and contained within an upright rigid substantially cylindrical tubular shell with upper and lower portions of the body part being respectively sealably engageable with upper and lower parts of the shell, and annular space being formed about the contained body part and to which a pulsating vacuum or pressure can be applied; said contained body part being arranged for location about an animal's teat and having an open upper collar part defining the inflation mouth for teat entry, and the lower portion of the body being provided with a milk outlet connectable to a vacuum milk line; said tubular body part being characterized by having a generally tapering formation along at least a major part of its length and by the provision on its inner wall surface of a plurality of annular ripples or undulations at intervals therealong with the minimum bore diameters of the ripples or undulations progressively decreasing from the uppermost ones

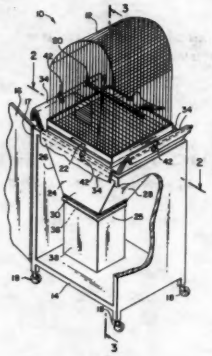
to the lowermost of said ripples or undulations; the lowermost ripple or undulating terminating in close proximity to the milk outlet at the lower end of the contained body part with the lower trough of said lowermost ripple merging into a small chamber above said outlet and below the lower end of the animal's teat when located within the contained body part, and said milk outlet being of substantially lesser diameter than the lowermost ripple or undulation.

4,572,107

EASILY CLEANABLE ANIMAL ENCLOSURE

Vito Clarizo, 25-34 College Point Blvd., College Point, N.Y. 11354

Filed Oct. 29, 1984, Ser. No. 665,705
Int. Cl.[4] A01K *31/06*
U.S. Cl. 119—17 **4 Claims**



1. An easily cleanable animal enclosure which comprises:
(a) a cage having a horizontal animal-supporting mesh floor for passage of excreted matter therethrough;
(b) a funnel below said cage for receiving said excreted matter passing through said mesh floor of said cage, said funnel have a discharge opening at its lower end;
(c) a box-like base member having an open top for supporting said funnel, said cage being removable from said funnel;
(d) a perch for animal to sit on;
(e) said mesh floor being a removable grill with handle so that said grill can be removed and cleaned.
(f) a lip placed around said discharge opening of said funnel;
(g) a sack detachable from said lip of said funnel; and
(h) a disposable inner bag removable from and replaceable within said sack to catch any excreted matter that falls through said funnel.

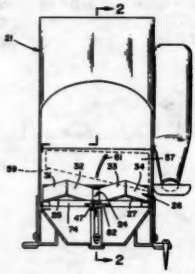
4,572,108

COMPACT, ANIMAL-OPERATED ANIMAL FEEDER

Theodore S. Daifotes, P.O. Box 383, Oak Hill Acres, Tuolumne, Calif. 95379

Filed Jun. 11, 1984, Ser. No. 619,300
Int. Cl.[4] A01K *5/00*
U.S. Cl. 119—51 R **16 Claims**

1. A compact, animal-operated animal feeder including enclosure means defining a feed volume and formed with a feed opening therein, and barrier means mounted to said enclosure means for movement by said animal from a closed position extending across said feed opening to an open position permitting access by said animal through said feed opening to said feed volume, wherein the improvement in said animal feeder is comprised of:
said barrier means being formed as a foldable door assembly having a plurality of articulated door panels movably mounted to said enclosure means for lateral folding movement from said closed position to said open position, said door assembly being partially folded in said closed position



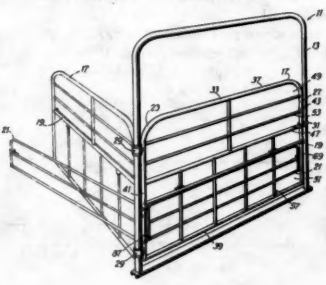
so that an inward force applied by said animal against said door assembly will fold said door assembly laterally to said open position.

4,572,109

ANIMAL SEPARATOR GATE

Edward T. Nixon, Rte. 3, Box 62A, Ninety-Six, S.C. 29666

Filed Aug. 16, 1984, Ser. No. 641,312
Int. Cl.[4] A01K *29/00*
U.S. Cl. 119—155 **15 Claims**



1. A gate for sorting animals, comprising:
(a) a jamb;
(b) a main door which swings within the jamb, comprising:
(i) a main door frame forming the periphery of the main door;
(ii) a horizontal bar extending between the left portion of the main door frame and the right portion of the main door frame;
(iii) a plurality of vertical animal separator bars extending from the horizontal bar to the lower portion of the main door frame;
(iv) at least one hinge connected to the main door frame and the jamb; and
(v) at least one fastener for connecting the main door frame to the jamb to prevent the main door from swinging;
(c) a horizontal animal height selection bar adjustably mounted on the main door; and
(d) a small animal door which swings within the main door, comprising:
(i) a small amimal admittance door frame forming the periphery of the small animal admittance door;
(ii) at least one hinge connected to the small animal admittance door frame and to the main door frame below the horizontal bar of the main door frame; and

(iii) at least one fastener attached to the small animal admittance door frame for connecting the small animal admittance door frame to the main door frame to prevent the small animal admittance door from swinging.

4,572,110

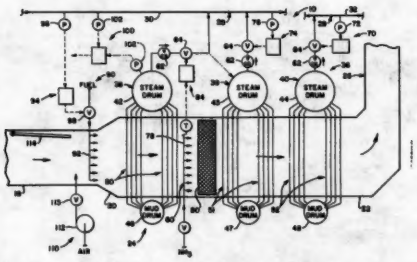
COMBINED HEAT RECOVERY AND EMISSION CONTROL SYSTEM

Jack Haeflich, West Hartford, Conn., assignor to Energy Services Inc., Farmington, Conn.

Filed Mar. 1, 1985, Ser. No. 707,074

Int. Cl.[4] F22D *1/00*

U.S. Cl. 122—7 R **17 Claims**



1. In a cogeneration plant having a gas turbine engine, an electric generator driven by the engine and a combined heat recovery and emission control system for the recovery of heat from and reduction of pollutants in the exhaust gas stream from the engine, the combined system comprising a plurality of steam boilers, each having at least one bank of a plurality of steam generating tubes, a steam conduit system having a first steam header for supplying steam at a first preselected nominal pressure, an emission control unit for reducing pollutants in the exhaust gas stream by chemical conversion, a duct for conducting the exhaust gas stream through said banks of steam generating tubes and the emission control unit, the plurality of steam boilers comprising a first steam boiler having its said bank of steam generating tubes upstream of the emission control unit and a second steam boiler having its said bank of steam generating tubes downstream of the emission control unit, said first and second steam boilers being connected for supplying steam to the steam conduit system, the improvement wherein said first steam boiler is an exhaust gas temperature regulating boiler having a first, exhaust gas temperature responsive, boiler control system for regulating the supply of steam from said first steam boiler to the steam conduit system in accordance with the temperature of the exhaust gas stream at the emission control unit, to vary the operating pressure of said first steam boiler, and thereby vary the temperature and heat exchange rate of said bank of steam generating tubes of said first steam boiler, to maintain the exhaust gas stream at the emission control unit at a preestablished desired nominal temperature for said chemical conversion.

4,572,111

HEATING APPARATUS

John E. Bowen, Kings Heath, England, assignor to Condensing Boilers Limited, Birmingham, England

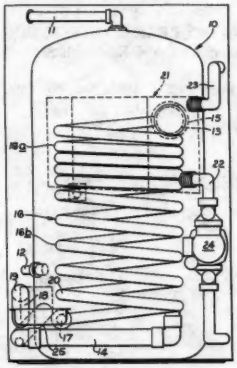
Filed Jun. 14, 1982, Ser. No. 388,226

Claims priority, application United Kingdom, Jun. 19, 1981, 8118978

Int. Cl.[4] F22B *5/02*

U.S. Cl. 122—17 **9 Claims**

1. Heating apparatus comprising a fuel burner, flue ducting extending from the burner to an outlet along which flow products of combustion from the burner in use, and structure defining first and second chambers operatively carrying respective first and second bodies of fluid medium to be heated, the first chamber being in immediate relationship to an upstream zone of the flue ducting which zone contains or extends into close proximity to the burner, and the second chamber being in immediate relationship to a downstream zone of the flue ducting between said upstream zone and the outlet wherein the improvement comprises said chambers being in immediate surrounding relationship to said respective zones of said ducting and the second chamber being also in immediate surrounding relationship to the structure defining the first chamber whereby the second body of medium is operatively heated by heat transfer directly within said structure both from said downstream zone and from the first chamber, said first chamber being located in the upper portion of said second chamber, said second chamber having an inlet in the lower end thereof and an outlet in the upper end thereof for passage of said second body of fluid medium.



4,572,112

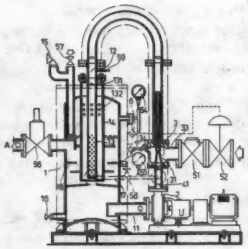
APPARATUS FOR FEEDING STEAM/LIQUID INTO A STEAM GENERATOR

Jaw-Cheng Chiang, No. 6, Hsin Kai Yuen, Ching Yuen Village, Tzi Sang Hsiung, Tai Don Hsien, Taiwan

Filed Apr. 11, 1985, Ser. No. 721,998

Int. Cl.[4] F22D *5/26*

U.S. Cl. 122—451 R **6 Claims**



1. A fluid feeding apparatus capable of gradually elevating the head of a fluid of steam/liquid mixture for forcing it into a steam boiler, comprising:

a fluid reservoir for forming a static pressure including an upper inlet and a lower outlet;

a pump having an entrance port communicating with said lower outlet, and an exhaust port;

an injector means including a rear tube portion communicating with said exhaust port, a front nozzle portion pointing

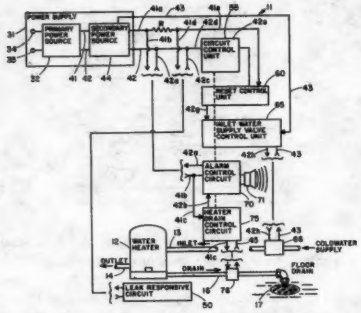
toward said upper inlet, and a fluid intake port disposed in the vicinity of said front nozzle portion, whereby the fluid from the lower outlet will be actuated by the pump to elevate its head and be ejected to the upper inlet while a fluid of lower pressure from the intake port will be entrained into said upper inlet so that the intermixed fluids of different pressures will attain a static pressure in the fluid reservoir for the next circulatory head elevation.

4,572,113

WATER LEAK CONTROL CIRCUIT

George W. Baughman, 106 S. Interlachen, Winter Park, Fla. 32789

Filed Feb. 1, 1985, Ser. No. 697,156
Int. Cl.[4] F22B *37/42*
U.S. Cl. 122—504.2 20 Claims



1. A water leak control circuit in combination with a water heater having an inlet; said water leak control circuit providing for the simultaneous detection of leaks, activation of an alarm, shutting off a water supply to said inlet and releaseably maintaining said alarm activated and said water shut-off, said control circuit including:

a power supply means,

said inlet controlled by an electromagnetic inlet valve means which is biased to a closed position when power is removed from said electromagnetic inlet valve means,

circuit control means connected in series with a reset control means and said power supply means,

said circuit control means controllingly connected to said reset control means, an inlet water supply valve control means, and an alarm control means,

said inlet water supply valve control means is controllingly coupled to said electromagnetic inlet valve means and said alarm control means is controllingly coupled to said alarm,

a leak responsive circuit means having a portion thereof positioned beneath said water heater whereupon the appearance of leaking water from said heater causes a change in the electrical property of a circuit component in said leak responsive circuit means,

said leak responsive circuit means electrically coupled between said circuit control means and said power supply means to thereby interrupt electrical power to said circuit control means and said reset control means which results in the deenergization of said circuit control means and the simultaneous closing of said electromagnetic inlet valve means and the activation of said alarm,

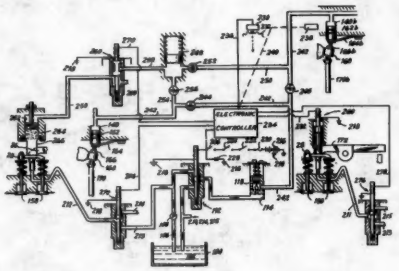
said circuit control means controlled by said reset control means to remain deenergized even though said leak responsive circuit means which has had said leak induced circuit component electrical property change, restored to a normal condition due to the subsequent evaporation of said leaked water from said portion of said leak responsive circuit means.

4,572,114

PROCESS AND APPARATUS FOR COMPRESSION RELEASE ENGINE RETARDING PRODUCING TWO COMPRESSION RELEASE EVENTS PER CYLINDER PER ENGINE CYCLE

Kenneth H. Sickler, Simsbury, Conn., assignor to The Jacobs Manufacturing Company, Bloomfield, Conn.

Continuation-in-part of Ser. No. 616,125, Jun. 1, 1984, abandoned. This application Apr. 30, 1985, Ser. No. 728,947
Int. Cl.[4] F02B *69/06*
U.S. Cl. 123—21 9 Claims



1. A process for compression release retarding of a cycling multi-cylinder four cycle internal combustion engine having a crankshaft and an engine piston operatively connected to said crankshaft for each cylinder thereof and having intake and exhaust valves for each cylinder thereof, comprising, for at least one cylinder thereof, the steps of reducing the flow of fuel to said cylinder, commencing opening the exhaust valve for said cylinder prior to the top dead center position of the said engine piston during an upstroke of the piston corresponding to its compression stroke during normal operation of the engine to produce a first compression release retarding event, closing said exhaust valve after the top dead center position of said engine piston, opening said intake valve during the ensuing downstroke of the piston to produce a first forced intake, closing said intake valve at substantially the ensuing bottom dead center position of said engine piston, disabling said exhaust valve from moving at the point it would move in the cycle during normal operation of the engine, disabling said intake valve from moving at the point it would move in the cycle during normal operation of the engine, commencing reopening said exhaust valve substantially at the ensuing top dead center position of the engine position to produce a second compression release retarding event, reopening said intake valve during the next downstroke of the piston to produce a second forced intake, reclosing said exhaust valve after the top dead center position of said engine piston, and reclosing said intake valve at substantially the ensuing bottom dead center position of said engine piston whereby one compression release event is produced in said one cylinder during each revolution of said crankshaft.

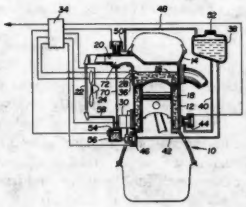
6. An engine retarding system of a gas compression release type comprising a multi-cylinder four cycle internal combustion engine having a crankshaft and a camshaft driven in synchronism with said crankshaft, engine piston means associated with said crankshaft, exhaust valve means and intake valve means associated with each cylinder of said engine, first and second pushtube means driven from said camshaft, hydraulic fluid supply means, hydraulically actuated first piston means associated with said exhaust valve means to open said exhaust valve means, second piston means actuated by said first pushtube means and hydraulically interconnected with said first piston means and said hydraulic fluid supply means to open said exhaust valve means during an upstroke of the engine piston associated with said exhaust valve means corresponding to its compression stroke during normal operation of the en-

gine to produce a first compression release event, first means responsive to hydraulic pressure supplied by said hydraulic fluid supply means adapted to disable the normal operation of said exhaust valve means, second means responsive to hydraulic pressure supplied by said hydraulic fluid supply means adapted to disable the normal operation of said intake valve means, third piston means associated with said intake valve means and hydraulically interconnected with said first and second piston means to open said intake valve means at a predetermined time, fourth piston means actuated by said second pushtube means and hydraulically interconnected with said first, second and third piston means to actuate said first piston means to open said exhaust valve means during an upstroke of the engine piston associated with said exhaust valve means corresponding to its exhaust stroke during normal operation of the engine to produce a second compression release event and thereafter to actuate said third piston means to open said intake valve means whereby one compression release event is produced in each cylinder during each revolution of said crankshaft.

4,572,115
PARTS-ARRANGEMENT IN BOILING LIQUID COOLING SYSTEM

Yoshimasa Hayashi, Kamakura City, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Feb. 5, 1985, Ser. No. 698,397
Claims priority, application Japan, Feb. 23, 1984, 59-32995
Int. Cl.[4] F01P 3/22
U.S. Cl. 123—41.21 **6 Claims**



1. In a boiling liquid cooling system for an engine which generates heat when operated,

an arrangement comprising:

means defining in the engine a coolant jacket into which coolant is introduced in liquid state through an inlet port formed in the engine and from which coolant is discharged in gaseous state through an outlet port formed in the engine;

a radiator into which gaseous coolant from said outlet port is introduced to be liquefied;

a separate coolant reservoir into which the liquefied coolant from the radiator is introduced;

an electric pump by which the liquid coolant in said reservoir is pumped to said coolant jacket through said inlet port of the coolant jacket;

a first conduit connecting said radiator, said separate coolant reservoir and said electric pump to form a coolant circulation circuit which extends between said inlet and outlet ports of the coolant jacket; and

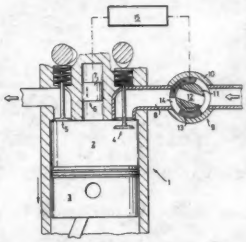
at least one electromagnetic valve associated with said coolant circulation circuit to control flow of the coolant in the circuit,

wherein said separate coolant reservoir, said electric pump and said electromagnetic valve are positioned close to the engine proper so as to effectively absorb heat generated by the engine.

4,572,116
INTERNAL COMBUSTION ENGINE

Lars G. B. Hedelin, Skärsnäsvägen 5, S-18263 Djursholm, Sweden

PCT No. PCT/SE83/00032, § 371 Date Sep. 28, 1983, § 102(e) Date Sep. 28, 1983, PCT Pub. No. WO83/02645, PCT Pub. Date Aug. 4, 1983
PCT Filed Jan. 31, 1983, Ser. No. 545,384
Claims priority, application Sweden, Jan. 29, 1982, 8200506
Int. Cl.[4] F02B 75/04
U.S. Cl. 123—78 D **16 Claims**



1. An internal combustion engine comprising:

an engine having at least one chamber defined therein, a combined channel defined in the engine and communicating with the chamber for the flow of gas both into and out of the chamber; the engine having an inlet channel defined therein and communicating with the combined channel for inflowing gas into the combined channel and an exhaust channel defined therein and communicating with the combined channel for outflowing gas out of the combined channel;

a movable working member in the chamber for compressing gas in the chamber;

regulating means for regulating the compression of the gas in the chamber by the movable working member;

valve means for controlling the flow of gas between the chamber and the combined channel, the valve means comprising a combined inlet and outlet valve, the combined inlet and outlet valve being movable between an open position for permitting the flow of gas between the chamber and the combined channel and a closed position for preventing the flow of gas therebetween; and

a regulating valve for opening and closing connections between the combined channel and the inlet and exhaust channels for regulating the flow of gas therebetween.

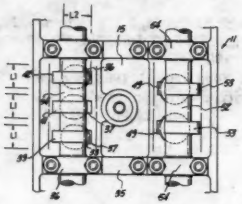
4,572,117
VALVE ARRANGEMENT FOR AN INTERNAL COMBUSTION ENGINE

Masaaki Yoshikawa, Iwata, Japan, assignor to Yamaha Hatsukoki Kabushiki Kaisha, Iwata, Japan

Filed Mar. 14, 1985, Ser. No. 712,017
Claims priority, application Japan, Mar. 15, 1984, 559-49898
Int. Cl.[4] F01L 3/10; F02B 31/02
U.S. Cl. 123—90.65 **10 Claims**

1. In an internal combustion engine comprising components defining a combustion chamber and a pair of poppet type valves for controlling the communication with said combustion chamber, said valves having their heads and stems positioned in close proximity, the improvement comprising coil springs each acting on a respective one of said valve stems for urging said valves to their closed position, said valve springs

having their coils arranged to have a long axis and a short axis in planes perpendicular to the stems of said valves with the



long axes of said springs of the respective valves being in parallel planes.

4,572,118

VARIABLE VALVE TIMING FOR FOUR-STROKE ENGINES

Michel Baguéna, 62, Av. Aristide Briand, Paron-Sens (89100), France

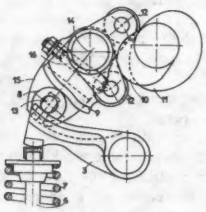
PCT No. PCT/FR82/00221, § 371 Date Aug. 30, 1983, § 102(e) Date Aug. 30, 1983, PCT Pub. No. WO83/02301, PCT Pub. Date Jul. 7, 1983

PCT Filed Dec. 29, 1982, Ser. No. 537,378

Claims priority, application France, Dec. 31, 1981, 81 24559

Int. Cl.⁴ F01L *1/34*

U.S. Cl. 123—90.16 **8 Claims**



1. Valve control mechanism for an internal combustion engine, for varying the lift of at least one valve of said engine, and comprising a kinematic chain including:

main cam means having one driving cam rotating around a first rotation axis which is a fixed axis, for producing an invariable alternating primary movement;

secondary cam means, consisting of a rocking cam to which said invariable alternating primary movement is transmitted so that said rocking cam produces a valve lift secondary movement for lifting said valve against the action of a return spring, with the help of at least one valve actuating member;

roller means interposed between and in contact with said valve actuating member and a profile of said rocking cam for transmitting to said valve actuating member said valve lift secondary movement that said roller means receives from said rocking cam; and,

control means allowing to cause a relative displacement between said roller means and said rocking cam for making use of a portion of said rocking cam profile, wherein,

said rocking cam is a cam oscillating around a second rotation axis and having at least one contact member in contact with said driving cam for transmitting said invariable alternating primary movement from said driving cam to said rocking cam,

said roller means comprises a roller mounted on a roller axis and which contacts said rocking cam with said roller and said valve actuating member with said roller axis so that said roller receives said valve lift secondary movement from said rocking cam whereas said roller axis communicates said valve lift secondary movement to said valve actuating member; and,

said control means includes support arms which are adjustably fastened about said second rotation axis and present guide grooves in which said roller axis is engaged and guided by its two ends, for changing the relative position between said roller and said rocking cam and thus the valve lift by changing the position of said support arms and thus of said roller around said second rotation axis.

4,572,119

IGNITION TIMING SENSOR FOR DIESEL ENGINE

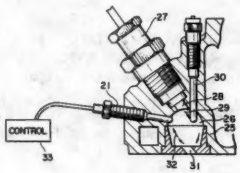
Shinji Ikeda, Susono, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed Apr. 6, 1984, Ser. No. 597,606

Claims priority, application Japan, Apr. 28, 1983, 58-63976; Aug. 12, 1983, 58-124434

Int. Cl.⁴ F02P *5/04;* **F02M** *31/00;* **G01L** *23/22*

U.S. Cl. 123—145 A **2 Claims**



1. An ignition timing sensor system for use in a diesel engine swirl chamber, comprising:

a connecting jet connecting said swirl chamber to a main combustion chamber;

a fuel injection nozzle having a fuel jet opening into said swirl chamber substantially tangentially to a wall of said swirl chamber;

a glow plug mounted in said swirl chamber and including a heater positioned downstream from said fuel jet with respect to the direction of fuel flow injected from said fuel jet; and

an ignition sensor mounted in said swirl chamber, said sensor including a first end extending into said swirl chamber and an optical conductor projecting through said first end into said swirl chamber, said first end being displaced from said direction of fuel flow and positioned downstream from said connecting jet with respect to the direction of air flow from said main combustion chamber, said air flow abutting against and washing said optical conductor.

4,572,120

SEPARATE LUBRICATING SYSTEM FOR MARINE PROPULSION DEVICE

Kuniyoshi Matsumoto, Iwata, Japan, assignor to Sanshin Kogyo Kabushiki Kaisha, Japan

Filed May 16, 1984, Ser. No. 610,847

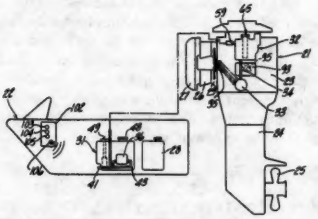
Claims priority, application Japan, May 17, 1983, 58-84996; May 17, 1983, 58-84997; May 23, 1983, 58-89175; May 23, 1983, 58-89176; May 23, 1983, 58-89177; May 23, 1983, 58-89178; May 24, 1983, 58-89973

Int. Cl.⁴ F01M *1/00*

U.S. Cl. 123—196 S **47 Claims**

1. In a lubricating system for a two-cycle internal combustion engine comprising a relatively large remotely positioned lubricant storage tank, a relatively small lubricant delivery tank positioned in proximity to the engine for delivering lubricant to its lubricating system and means responsive to the level of lubricant in said delivery tank for transferring lubricant from said storage tank to said delivery tank to maintain a

predetermined level of lubricant in said delivery tank, the improvement comprising means for providing a warning signal when the level of lubricant in said storage tank falls below a predetermined amount, said means for providing said warning signal being further operative to discontinue the transfer of



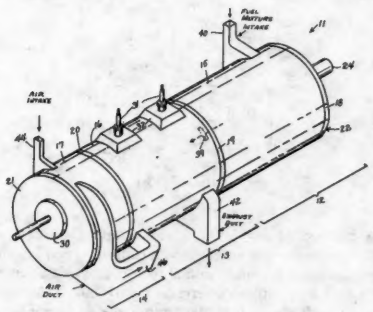
lubricant from the storage tank to the delivery tank, and manual override means for operating the means for transferring lubricant from the storage tank to the delivery tank under operator control even when the warning signal has been activated.

4,572,121

ROTARY VANE TYPE I.C. ENGINE WITH BUILT-IN SCAVENGING AIR BLOWER

Victor Chang, Panameric, Venezuela, assignor to Instituto Venezolano de Investigaciones Cientificas (I.V.I.C.), Caracas, Venezuela

Filed Sep. 29, 1982, Ser. No. 431,734
Int. Cl.⁴ F02B *53/08*
U.S. Cl. 123—203 **12 Claims**



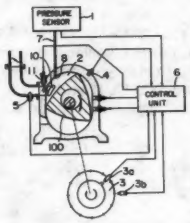
1. A rotary internal combustion engine comprising a housing assembly including three sections and having a single common power shaft, said three sections being integrally connected together and operatively connected together into a unitary self-contained engine, air and fuel mixture intake conduit means communicatively connected to a first of said three sections, means in said first section to perform admission and compression of said air and fuel mixture admitted from said conduit means, means to convey the compressed air and fuel mixture to a second of said three sections; a single internal partition wall means between said first and second sections, and said air and fuel mixture conveying means comprising a port formed in said partition wall means; means in said second section to ignite the compressed air and fuel mixture and to permit expansion of the ignited air and fuel mixture to thereby furnish power strokes to said power shaft; means in said second section for exhausting the gaseous products of combustion, air blower means in the third of said three sections driven by said power shaft, means to convey air blown from said third section to said second section to exert a scavenging action on said products of combustion, and said three sections comprising axially aligned cylindrical chambers with said second section between said first and third sections, and said common power shaft being eccentrically journalled in said chambers and disposed generally axially of said engine.

4,572,122

METHOD OF CONTROLLING INTERNAL COMBUSTION ENGINE

Kenichiro Kamai, Toyoake; Norio Omori, Kariya; Masumi Kinugawa, Okazaki, and Mitsunori Takao, Kariya, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Dec. 5, 1983, Ser. No. 558,193
Claims priority, application Japan, Dec. 14, 1982, 57-219643
Int. Cl.⁴ F02B *53/02;* F02D *35/02;* F02P *5/10*
U.S. Cl. 123—206 **3 Claims**



1. A method of controlling operation of an internal combustion engine in accordance with a pressure in an engine cylinder or working chamber into which air is sucked through an intake port for combustion with fuel, said method comprising the steps of:

connecting a pressure sensor to said engine cylinder or working chamber through a connecting pipe so that the pressure in said engine cylinder or working chamber is transmitted to said pressure sensor through said connecting pipe and said pressure sensor produces an output signal indicative of the transmitted pressure;

generating a trigger signal at a predetermined angular position of an output shaft of said engine at which position the pressure in said engine cylinder or working chamber is desired to be detected for controlling said internal combustion engine; and

detecting the output signal of said pressure sensor produced after a predetermined interval of time from generation of said trigger signal so that the detected output signal is used to control the operation of said engine, said predetermined interval of time corresponding to a transmission delay of the pressure through said connecting pipe.

4,572,123

INTERNAL COMBUSTION ENGINE SQUISH JET COMBUSTION CHAMBER

Robert L. Evans, West Vancouver, Canada, assignor to The University of British Columbia, Vancouver, Canada

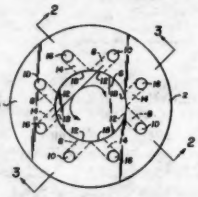
Filed Jun. 22, 1984, Ser. No. 623,740
Int. Cl.⁴ F02F *3/28*
U.S. Cl. 123—262 **32 Claims**

1. An internal combustion engine block having a piston and cylinder head, one of which has:

(a) a substantially cylindrical bowl opening into the face thereof;

(b) a pair of squish jet passages having respective inlets communicating with the face thereof, and respective, transversely spaced, outlets directed substantially tangentially into the bowl, the outlet of a first one of the pair being directed upwardly, and the outlet of second one of

the pair being directed downwardly from a position above the outlet of the first one, so that a counter-rotating, bi-



level swirl can be produced in the bowl by the squish jet outlets.

4,572,124

PILOT INJECTION DEVICE

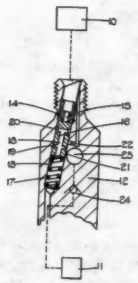
Stuart W. Nicol, London, England, assignor to Lucas Industries Public Limited Company, Birmingham, England

Filed Sep. 17, 1984, Ser. No. 651,268

Claims priority, application United Kingdom, Oct. 1, 1983, 8326356

Int. Cl.[4] F02M *45/04*

U.S. Cl. 123—300 **3 Claims**



1. A fuel injection system for supplying fuel to a compression ignition engine and comprising a high pressure fuel pump for supplying fuel in timed relationship with the associated engine and a fuel injection nozzle incorporating a resiliently loaded fuel pressure operable valve member which controls fuel flow from a nozzle inlet to an outlet of the nozzle, means defining a cylinder adjacent to the inlet of the nozzle, one end of the cylinder communicating with the high pressure fuel pump and the other end of the cylinder communicating with said inlet of the nozzle, a shuttle slidable in the cylinder, an insert in screw thread engagement within an inlet into said one end of the cylinder, said insert being adjustable through said last named inlet, resilient means biasing the shuttle into contact with said insert, first and second passage means opening onto the periphery of the shuttle at axially spaced positions, said first and second passage means communicating with said other end of the cylinder, first and second axially spaced ports formed in the wall of said cylinder for communication with said first and second passage means respectively during movement of the shuttle against the action of the spring, said first port communicating with a low pressure source and the second port communicating with the high pressure fuel pump, and a non-return valve interposed between said other end of the cylinder and said low pressure source, said non-return valve being arranged to allow fuel flow into said other end of the cylinder during movement of the shuttle under the action of the resilient means, the arrangement being such that during the initial delivery of fuel by the fuel pump, the shuttle will be displaced in the cylinder against the action of said resilient means and fuel will be displaced to the nozzle, and after a predetermined movement of the shuttle said first passage means will be brought into register with said first port thereby to reduce the pressure in the other end of the cylinder and to interrupt the flow of fuel to the injection nozzle, the shuttle continuing to move as the output pressure developed by the high pressure pump increases, until said first passage means moves out of register with said first port, whereafter fuel supply to the nozzle is restored, the movement of the shuttle being halted when the second passage means is brought into register with the second port, the shuttle returning into contact with the insert under the action of the resilient means, when the supply of fuel by the high pressure pump ceases, the axial setting of the insert determining the pilot volume of fuel supplied to the nozzle.

4,572,125

METHOD OF AND DEVICE FOR REGULATING ROTARY SPEED OF AN INTERNAL COMBUSTION ENGINE

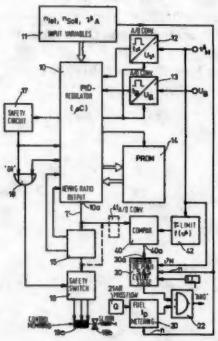
Alfred Kratt, Trossingen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Nov. 30, 1984, Ser. No. 678,003

Claims priority, application Fed. Rep. of Germany, Dec. 17, 1983, 3345711

Int. Cl.[3] F02D *37/00*

U.S. Cl. 123—325 **7 Claims**



1. A method of regulating a rotary speed of an internal combustion engine provided with an idling speed regulating system producing a control signal for maintaining a minimum rotary speed and with an overrun or push cutoff device producing a cutoff signal for interrupting the fuel supply when rotary speed exceeds an idling speed and the engine is simultaneously in an overrunning or pushing operational condition, comprising the steps of comparing the control signal with a preset limit value and, when the limit value is exceeded, blocking the function of the overrun or push cutoff device.

4,572,126

APPARATUS FOR CONTROLLING THE OVERRUN MODE OF OPERATION OF AN INTERNAL COMBUSTION ENGINE

Herbert Arnold, Eberdingen; Heinz Hofer, Weissach, and Michael Horbelt, Schwieberdingen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Oct. 17, 1984, Ser. No. 661,805

Claims priority, application Fed. Rep. of Germany, Oct. 18, 1983, 3337786

Int. Cl.[4] F02D *5/02*

U.S. Cl. 123—325 **11 Claims**

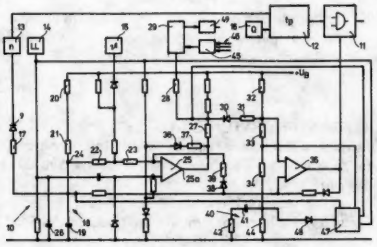
1. Apparatus for controlling the overrun mode of operation

of an internal combustion engine in dependence upon the instantaneous actual speed and a resume-speed threshold characteristic, the apparatus including a throttle flap sensor and further comprising:

speed comparator means for generating an overrun signal indicative of the presence of an overrun condition;

evaluation circuit means for determing a fuel cutoff signal or a fuel metering signal;

means responsive to said overrun signal for cutting off the



metering of fuel to the engine during said overrun condition and responsive to said fuel metering signal for resuming the metering of fuel to the engine after said overrun condition has passed; and,

disabling means dependent upon engine speed for disabling the overrun cutoff function in the resumed condition for a predetermined period of time after said overrun condition has passed, whereby undesired abrupt resume and cutoff changes in the torque developed by the engine are avoided.

4,572,127

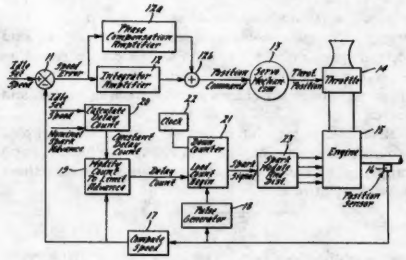
INTERACTIVE SPARK AND THROTTLE IDLE SPEED CONTROL

Robert L. Morris, Plymouth, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Apr. 1, 1985, Ser. No. 718,619

Int. Cl.[4] F02M *3/07*

U.S. Cl. 123—339 **10 Claims**



1. A method of controlling the idling speed of an internal combustion engine comprising the steps of:

establishing a desired engine idle speed;

sensing the actual engine idle speed;

generating an engine idle speed error signal in proportion to the difference between the desired engine idle speed and the actual engine idle speed.

applying the speed error signal to the parallel combination of a phase compensator for adjusting the phase of the speed error signal with respect to time and an integrator for integrating the speed error signal with respect to time;

applying an output from the phase compensator and an output from the integrator to a summer; and

generating a throttle command signal in proportion to an output from the summer for controlling air flow through the throttle of the internal combustion engine.

4,572,128

FUEL INJECTION CARBURETOR IN INTERNAL COMBUSTION ENGINE

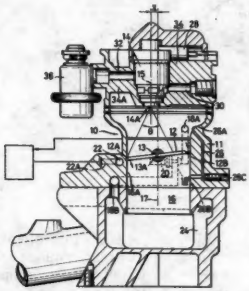
Takamitsu Okamoto, and Keisou Takeda, both of Sasono, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed Sep. 12, 1984, Ser. No. 649,608

Claims priority, application Japan, Sep. 13, 1983, 58-141876[U]; Oct. 4, 1983, 58-153916[U]

Int. Cl.[3] F02M *3/00*

U.S. Cl. 123—339 **24 Claims**



1. A fuel injection carburetor in an internal combustion engine, comprising: a fuel injection valve provided at a position upstream of a throttle valve and directed to the throttle valve; an idling bypass air passage, an inlet and an outlet of which are opened at a position upstream and a position downstream of the throttle valve in a throttle bore, respectively, bypassing the throttle valve; and a bypass air passage for the idle adjustment to correct air flow rate in the idling bypass air passage; wherein the range of fuel spray angle of said fuel injection valve is determined such that said fuel injection valve is disposed in such a manner that a position on the surface of the throttle valve, to which the sprayed fuel reaches, is always located at an opening forward end in the downstream direction of the throttle valve rather than an opening forward end in the upstream direction within the total throttle opening of the throttle valve from the full closing to the full opening, and an outlet of the bypass air passage for the idle adjustment is provided on an inner wall on the side of the opening forward end in the upstream direction of the throttle valve.

4,572,129

AIR-FUEL RATIO FEEDBACK CONTROL METHOD FOR INTERNAL COMBUSTION ENGINES

Yutaka Otobe, Shiki, Japan, assignor to Honda Giken Kogyo K.K., Tokyo, Japan

Filed Jun. 7, 1984, Ser. No. 618,205

Claims priority, application Japan, Jun. 17, 1983, 58-108950

Int. Cl.[4] F02B *3/00*

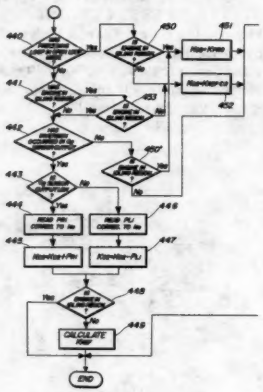
U.S. Cl. 123—440 **5 Claims**

1. A method of effecting feedback control of the air-fuel ratio of an air-fuel mixture being supplied to an internal combustion engine having an exhaust pipe and an exhaust gas ingredient concentration detecting means arranged in said exhaust pipe, by correcting a basic value of fuel supply quantity by the use of a coefficient variable in value in response to the output of said exhaust gas ingredient concentration detecting means, while said engine is operating in a predetermined

air-fuel ratio feedback control region other than an idling region, the method comprising the steps of:

(1) determining whether or not said engine is operating in said predetermined air-fuel ratio feedback control region;

(2) calculating a mean value of values of said coefficient which have been applied in said feedback control, when said engine is operating in said predetermined air-fuel ratio feedback control region;



(3) correcting the calculated mean value of said coefficient obtained at said step (2) by a predetermined value immediately when a transition occurs in the engine operation from a region other than said predetermined air-fuel ratio feedback control region to the latter region; and

(4) immediately initiating the air-fuel ratio feedback control by the use of the corrected mean value of said coefficient as an initial value.

4,572,130

METHOD OF CONTROLLING INDIVIDUAL CYLINDER FUEL INJECTION QUANTITIES IN ELECTRONICALLY CONTROLLED DIESEL ENGINE AND DEVICE THEREFOR

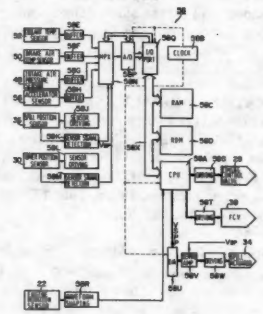
Keisuke Tsukamoto, Nagoya; Masaomi Nagase, and Kiyotaka Matsuno, both of Toyota, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Feb. 14, 1985, Ser. No. 701,626

Claims priority, application Japan, Mar. 2, 1984, 59-41059

Int. Cl.[4] F02D *31/00*

U.S. Cl. 123—357 **4 Claims**



1. A method of controlling individual cylinder fuel injection quantities in an electronically controlled diesel engine, wherein rpm variations with every explosion cylinder are detected and compared with one another, and a fuel injection quantity control actuator with every cylinder is controlled so as to make said rpm variations of the cylinders uniform, so that engine vibrations due to a dispersion in fuel injection quantity between the cylinders can be reduced, characterized in that the method comprises;

calculating a difference between the individual cylinder correction quantities of last time and this time;

determining a movement value corrected driving command timing to said fuel injection quantity control actuator in accordance with said difference; and

giving a driving command to said fuel injection quantity control actuator with every cylinder in accordance with said movement value corrected driving command timing.

4,572,131

GOVERNOR DEVICE OF DIESEL ENGINE

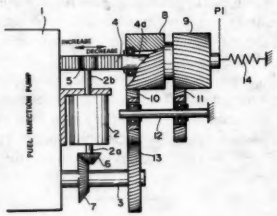
Haruo Hashimoto, Kamakura, and Toyoichi Ono, Isehara, both of Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed Jun. 6, 1984, Ser. No. 617,627

Claims priority, application Japan, Jun. 13, 1983, 58-105523

Int. Cl.[4] F02D *5/00*

U.S. Cl. 123—357 **9 Claims**



1. A governor device for a diesel engine comprising:

an electromagnetic clutch which shifts a control rack of fuel injection pumps of the diesel engine by use of driving force of the same engine; and

means for controlling said electromagnetic clutch, which in turn comprises:

means for setting a desired value of engine speed for delivering a command signal;

means for detecting actual engine speed; and

a driving circuit for controlling exciting current of said electromagnetic clutch based on a difference between an output signal of said engine speed setting means and an output signal of said engine speed detecting means, and wherein;

said electromagnetic clutch has an input shaft coupled through gears to a cam shaft for driving said fuel injection pumps, and an output shaft coupled with a pinion meshing with said control rack.

4,572,132

ELECTRONIC CONTROL SYSTEM FOR A DIESEL INJECTION SYSTEM OF AN INTERNAL COMBUSTION ENGINE

Fridolin Piwonka, Tamm, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Aug. 31, 1982, Ser. No. 413,304

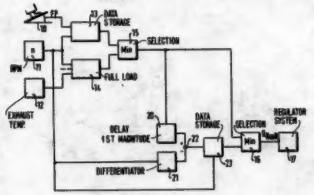
Claims priority, application Fed. Rep. of Germany, Feb. 11, 1982, 3204804

Int. Cl.[4] F02M *39/00*

U.S. Cl. 123—357 **6 Claims**

1. An electronic control system for a Diesel injection system of an internal combustion engine having a performance characteristic data storage means from which can be read a desired

signal for fuel amount value at least rpm- and gas pedal position-dependent, at least one minimal value selection stage connected at least to the output of said data storage for the purpose of limiting the amount of fuel, the output signal of said selection stage influencing a nominal value of the amount of fuel to be injected, and further including means responsive to smoke performance for limiting smoke generation, comprising at least one delay element comprising at least one of a first



and a higher order of a circuit transfer function for processing fuel volume and being acted upon by the output signal of said at least one minimal value selection stage, and

an additional performance characteristic data storage means connected at least to the output signal of said at least one delay element, whereby the output signal of said additional storage means influences said nominal amount of fuel to be injected.

4,572,133

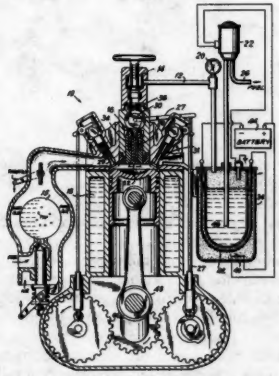
HIGH COMPRESSION RATIO AND EFFICIENCY GOVERNED SELF-IGNITION INTERNAL COMBUSTION ENGINE

Julius Bago, Star Rte. #3, Wurtsboro, N.Y. 12790

Continuation-in-part of Ser. No. 435,966, Oct. 22, 1982, abandoned. This application Dec. 21, 1984, Ser. No. 684,647

Int. Cl.⁴ F02B *3/00*

U.S. Cl. 123—431 **19 Claims**



1. An internal combustion engine operable on a fuel capable of being atomized at pressures above atmospheric pressure, which comprises:

(a) at least one piston and cylinder defining an internal combustion chamber of compression ratio sufficient to provide self-ignition with said fuel when mixed therein with air;

(b) intake means selectively communicating a first source of said fuel with said internal combustion chamber and operable in timed relation to piston stroke and position;

(c) exhaust means operable in timed relation to piston position to selectively permit combusted gases to exit the cylinder;

(d) means for selectively mixing fuel from said first fuel supply with air at relatively low pressure and for permitting said mixture to be introduced into said cylinder through said intake means during the intake stroke of the piston, the fuel/air ratio being less than the ratio required for self-ignition when the piston is at or near the top of the compression stroke;

(e) auxiliary fuel supply means maintained at a predetermined elevated pressure, the pressure being greater than the pressure within the combustion chamber when the piston is at or near top dead center; and

(f) valve means selectively opened and closed by means operatively linked to the crankshaft for selectively communicating said auxiliary fuel supply means with said combustion chamber and for selectively permitting a predetermined heated amount of said fuel under pressure to be introduced from said auxiliary fuel supply means into said combustion chamber in timed sequence such that when said piston is at a predetermined position at or near the top of the compression stroke of said piston, a predetermined amount of auxiliary fuel is permitted to be introduced into said combustion chamber sufficient to raise the fuel/air ratio therein to a level sufficient to cause governed self-ignition within said combustion chamber at the temperature caused by the compression of said first supply of fuel and air therein, whereby said first fuel and air mixture and said auxiliary pressurized and heated fuel supply results in substantial burning efficiency of the fuel therein thereby resulting in substantially improved efficiency of the energy output of said engine.

4,572,134

DOUBLE CARBURETOR

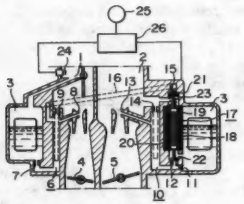
Hirofumi Nouthuka, and Mitsuo Ohfuji, both of Katsuta, Japan, assignors to Hitachi, Ltd. and Hitachi Automotive Eng. Co., Ltd., both of Tokyo, Japan

Filed Aug. 27, 1984, Ser. No. 644,693

Claims priority, application Japan, Aug. 29, 1983, 58-156446

Int. Cl.⁴ F02M *7/12*

U.S. Cl. 123—438 **14 Claims**



1. A double carburetor comprising a primary suction conduit and a secondary suction conduit located in a suction passage of an internal combustion engine equipped with a turbosupercharger for supplying supercharged air to a combustion chamber by means of a compressor driven by a turbine rotated by the energy of exhausts, wherein the improvement comprises:

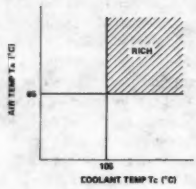
air-fuel ratio correcting control valve means for the primary suction conduit and air-fuel ratio correcting control valve means for the secondary suction conduit mounted in a primary main fuel system of a secondary main fuel system, respectively; and

a drive unit for driving, when the turbosupercharger is put into action, said air-fuel ratio correcting control valve means for the primary suction conduit and secondary suction conduit to increase fuel flow through the primary main fuel system and secondary main fuel system.

4,572,135
AIR-TO-FUEL RATIO CONTROL SYSTEM FOR AN ENGINE

Masataka Nakajima, Tokyo; Yasushi Mase, Hachioji, and Yoshiharu Tamura, Yokohama, all of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Oct. 29, 1984, Ser. No. 666,039
Claims priority, application Japan, Oct. 31, 1983, 58-205082
Int. Cl.[4] F02M *7/20*
U.S. Cl. 123—440 **12 Claims**



1. An air-to-fuel ratio control system incorporated with a carburetor for supplying fuel into an engine according to the amount of intake air, which comprises:

(a) an oxygen sensor for detecting oxygen concentration in engine exhaust gas and for outputting an oxygen sensor signal;

(b) an engine coolant temperature sensor for outputting an engine coolant temperature signal;

(c) an intake air temperature sensor for outputting an intake air temperature signal;

(d) air-to-fuel ratio control means for correcting the amount of fuel to be supplied to the engine so as to obtain mixture with a stoichiometric mixture ratio in response to the detected oxygen sensor signal in accordance with feedback method when the detected engine coolant temperature or the detected intake air temperature is below each reference value, for increasing the amount of fuel to be supplied to the engine so as to obtain rich mixture irrespective of the oxygen sensor signal for prevention of engine overheat when the detected engine coolant temperature and the detected intake air temperature exceed each reference value, and for outputting a control signal representative of the amount of fuel; and

(e) an actuator associated with the carburetor and activated in response to the control signal outputted from said control means.

4,572,136
FUEL INJECTION APPARATUS FOR AN INTERNAL COMBUSTION ENGINE

Yasuhiro Takeuchi, Okazaki; Yasuyuki Sakakibara, Nishio, and Kazuhide Watanabe, Toyohashi, all of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed Sep. 14, 1984, Ser. No. 650,719
Claims priority, application Japan, Sep. 19, 1983, 58-171282
Int. Cl.[4] F02M *39/00*
U.S. Cl. 123—447 **12 Claims**

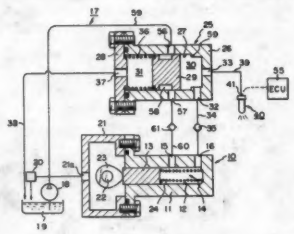
1. A fuel injection apparatus for an internal combustion engine, comprising:

an accumulator for storing therein pressurized fuel and continuously maintaining a pressure thereof at a predetermined fixed high level;

a fuel injection valve continuously connected to said accumulator for injecting the pressurized fuel in the accumulator into a combustion chamber of the engine, said injection valve being controlled to open and close by output signals from an external control unit;

a pressurized pump for pressurizing fuel delivered from a fuel-feed pump and for supplying it into said accumulator through a check valve; and

a work controlled means for controlling the amount of fuel supplied from said pressurizing pump through said check valve into said accumulator in accordance with variations of amount of fuel in said accumulator so as to decrease the amount of the fuel supplied from said pressurizing pump

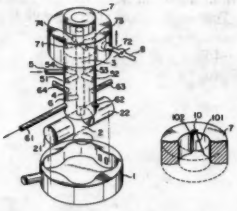


through said check valve into said accumulator when the amount of fuel in said accumulator is increased and to increase it when the amount of fuel in said accumulator is decreased.

4,572,137
DISTRIBUTOR TYPE FUEL INJECTION PUMP

Hirotaka Nakatsuka, Kariya; Masahiko Miyaki, Oobu, and Akira Masuda, Aichi, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Oct. 3, 1984, Ser. No. 657,148
Claims priority, application Japan, Oct. 3, 1983, 58-185775
Int. Cl.[4] F02M *41/00*
U.S. Cl. 123—450 **4 Claims**



1. A distributor type fuel injection pump for distributing fuel into combustion chambers of an internal combustion engine comprising:

a rotor rotatably driven by the engine and having therein a fuel passage coaxial with the rotor axis and a pump chamber communicating with the fuel passage,

pumping means for pressurizing fuel in the pump chamber by the rotatable drive of the rotor to deliver the pressurized fuel through the fuel passage, the pumping means having a cam ring disposed coaxially to surround the rotor and formed with a cam surface on the inner peripheral surface thereof and plungers reciprocating radially of the rotor in cooperation with the cam ring, thereby introducing fuel to the pump chamber and pressurizing the fuel introduced into the pump chamber;

distributing means for distributing the pressurized fuel delivered from the pump chamber to the fuel passage by the pumping means toward the respective combustion chambers of the engine; and

adjusting means for adjusting the quantity of pressurized fuel to be distributed by spilling the pressurized fuel delivered from the pump chamber to the fuel passage, said adjusting means including control means which controls a spill start time at which the spill of the pressurized fuel contained in the fuel passage is started and which sets, before the intro-

duction of the fuel is started, a spill finish time at which the spill of the pressurized fuel contained in the fuel passage is stopped.

4,572,138

FUEL INJECTION PUMPING APPARATUS

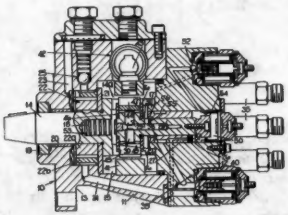
Dorian F. Mowbray, Burnham, England, assignor to Lucas Industries public limited company, Birmingham, England

Continuation of Ser. No. 465,044, Feb. 9, 1983, abandoned. This application Mar. 18, 1985, Ser. No. 712,914

Claims priority, application United Kingdom, Feb. 20, 1982, 8205051

Int. Cl.[4] F02M *41/00*

U.S. Cl. 123—450 5 Claims



1. A fuel injection pumping apparatus comprising a body part in which is mounted an axially movable and rotatable distributor member, said distributor member in use, being driven in timed relationship with an associated engine, a transverse bore formed in the distributor member and a pumping plunger therein, a passage in the distributor member in communication with the bore and opening to the periphery of the distributor member, an annular cam ring having cam lobes for imparting inward movement to the plunger as the distributor member rotates, outlet ports in the body said outlet ports being positioned to register with said fuel passage in turn as the distributor member rotates, while inward movement is imparted to the plunger, means for feeding fuel to said bore to effect outward movement of the plunger, stop means operable to limit the extent of outward movement of the plunger while fuel is supplied to said bore, the extent of outward movement of the plunger depending upon the axial position of the distributor member, means for extending the period of fuel injection during low speed engine operation when small quantities of fuel are being delivered to the engine by reducing the rate at which fuel is delivered, said means including an additional passage in the distributor member, said additional passage communicating with said bore and opening to the periphery of the distributor member, angularly spaced flow apertures in said body and with which said additional passage can communicate during inward movement of the plunger, means for restricting the rate of fuel flow through said additional passage, said additional passage being positioned so that fuel flow through said flow apertures can occur during the pumping action of said pumping plunger which forces fuel out of said transverse bore and engine speed responsive means for adjusting the angular setting of said cam ring, whereby at low engine speeds up to a predetermined speed and when the distributor member is set to provide a low fuel supply through an outlet port, fuel flow takes place through said apertures, the fuel which is lost through said apertures being made up by setting the distributor member to provide an increased fuel flow so that the period of fuel delivery through said outlet port is increased, fuel flow through the apertures ceasing when the engine speed exceeds said predetermined value.

4,572,139

FUEL SUPPLY CONTROL SYSTEM FOR AN INTERNAL COMBUSTION ENGINE

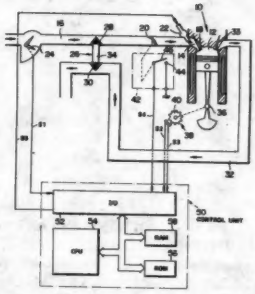
Kazuhiro Ishigami, Yokohama, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Filed Aug. 15, 1984, Ser. No. 640,861

Claims priority, application Japan, Aug. 29, 1983, 58-157665

Int. Cl.[4] F02B *29/00*; F02M *51/00*

U.S. Cl. 123—478 6 Claims



1. A fuel supply control system for an internal combustion engine having a combustion chamber, an air passage leading to the combustion chamber for conducting air to the combustion chamber, a throttle valve disposed in the air passage for adjusting the rate of air flow into the combustion chamber, and a compressor disposed in the air passage at a point upstream of the throttle valve for compressing the air, the system comprising:

(a) a flow meter disposed in the air passage at a point upstream of the compressor for sensing the rate of air flow through the air passage;

(b) first means, responsive to the flow meter, for injecting fuel into the air passage at a point downstream of the throttle valve at a rate having a preset relationship with the sensed air flow rate;

(c) second means for sensing whether or not the throttle valve is closed; and

(d) third means, responsive to the second means, for limiting the fuel injection rate to no more than a predetermined level regardless of the preset relationship between the fuel injection rate and the sensed air flow rate when the throttle valve is closed.

4,572,140

NITROUS OXIDE PRECOOLER

William M. Wheatley, Columbia, S.C., assignor to Ram Automotive Company, Canton, Ohio

Filed Oct. 9, 1984, Ser. No. 658,667

Int. Cl.[4] F02B *75/10*; F02M *31/20*

U.S. Cl. 123—541 13 Claims

1. A nitrous oxide precooler for a fuel charging system for a vehicle engine including:

(a) a container holding a supply of pressurized liquid nitrous oxide;

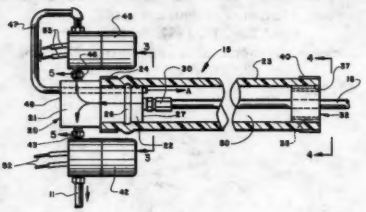
(b) conduit means for delivering nitrous oxide from the container to the vehicle engine;

(c) first valve means for controlling the flow of nitrous oxide from the conduit means to the engine;

(d) jacket means surrounding a portion of the conduit means for forming a cooling chamber to receive gaseous nitrous oxide for maintaining the nitrous oxide in the conduit means in a liquid state; and

(e) second valve means communicating with the conduit

means and cooling chamber for purging any gaseous nitrous oxide from the conduit means and injecting it into



said cooling chamber before actuation of the first valve means.

4,572,141

METHOD OF CONTROLLING INTAKE AIR QUANTITY FOR INTERNAL COMBUSTION ENGINES

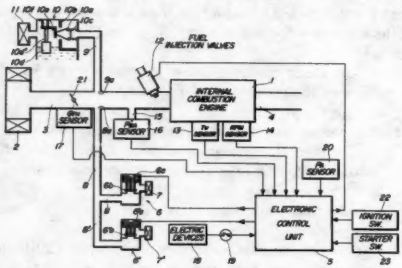
Shumpei Hasegawa, Niiza; Yoshibumi Mishima, Wako; Noriyuki Kishi, Itabashi, and Yuzi Makino, Mitaka, all of Japan, assignors to Honda Giken Kogyo K.K., Tokyo, Japan

Filed Dec. 21, 1984, Ser. No. 684,688

Claims priority, application Japan, Dec. 23, 1983, 58-243490

Int. Cl.[4] F02M *23/04*

U.S. Cl. 123—339 **14 Claims**



1. A method of controlling the quantity of intake air being supplied to an internal combustion engine having an intake passage, a throttle valve arranged in said intake passage, a first auxiliary air passage bypassing said throttle valve, a first control valve arranged in said first auxiliary air passage for controlling the quantity of supplementary air to be supplied to said engine through said first auxiliary air passage by means of on-off control of the opening area of said first auxiliary air passage, a second auxiliary air passage bypassing said throttle valve, and a second control valve arranged in said second auxiliary air passage for controlling the quantity of supplementary air to be supplied to said engine through said second auxiliary air passage by means of on-off control of the opening area of said second auxiliary air passage, the method comprising the steps of: (1) detecting atmospheric pressure encompassing said engine; (2) determining whether or not said engine is operating in a particular operating condition; and (3) selectively actuating said first and second control valves in response to the value of the atmospheric pressure detected at said step (1) in such a manner that the sum of the opening areas of said first and second auxiliary air passages increases as the detected value of the atmospheric pressure decreases, when said engine is determined to be operating in said particular operating condition.

4,572,142

ARRANGEMENT FOR SUPPLYING A MAXIMUM QUANTITY OF FUEL

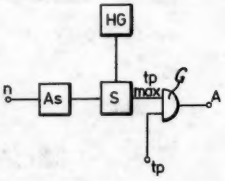
Herbert Arnold, Eberdingen; Michael Horbelt, Schwieberdingen, both of Fed. Rep. of Germany, and Gerald Dahlke, Huntington Beach, Calif., assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Continuation of Ser. No. 517,356, Jul. 25, 1983, abandoned. This application Nov. 27, 1984, Ser. No. 675,458

Claims priority, application Fed. Rep. of Germany, Oct. 2, 1982, 3236586

Int. Cl.[4] F02D *41/02*

U.S. Cl. 123—478 **7 Claims**



1. A method of limiting a quantity of fuel to be supplied to a combustion engine of a motor vehicle, comprising the steps of defining in dependency on load and rotary speed a first quantity of fuel to be supplied, determining air density of the surrounding air, determining in dependency on the air density and rotary speed a second quantity of fuel which is a limit for said first quantity, and limiting said first quantity of fuel to be supplied to the engine to said second quantity.

4,572,143

APPARATUS FOR DETECTING AND INDICATING ABNORMALITY IN AN ELECTRONIC CONTROL SYSTEM FOR INTERNAL COMBUSTION ENGINES

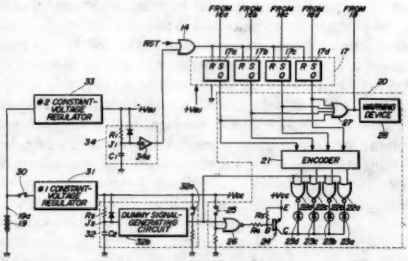
Shigeo Umesaki, Iruma, and Shumpei Hasegawa, Niiza, both of Japan, assignors to Honda Giken Kogyo K.K., Tokyo, Japan

Filed Feb. 21, 1985, Ser. No. 703,815

Claims priority, application Japan, Feb. 24, 1984, 59-33805

Int. Cl.[4] F02B *3/00*

U.S. Cl. 123—479 **10 Claims**



1. An apparatus for detecting and indicating abnormality in an electronic control system for an internal combustion engine, including a plurality of input means adapted to detect values of parameters indicative of operating conditions of said engine and generate signals indicative of the detected parameter values, a plurality of output means, a first power source, and control means operable on a supply voltage from said first power source to supply said output means with operation control signals dependent on the detected values of said parameter signals, said apparatus comprising:

a plurality of abnormality detecting means adapted to detect

abnormality in the operation of respective ones of said input means and said output means, and generate abnormality-indicative signals when abnormality is detected;

memory means for storing data of said abnormality-indicative signal supplied from any of said abnormality detecting means that has detected abnormality;

abnormality indicating means for indicating the data stored in said memory means; and

a second power source;

wherein said memory means is operable on a supply voltage from said second power source, said memory means being adapted to erase the data stored therein when it starts to be supplied with said supply voltage from said second power source.

4,572,144

FUEL INJECTION TIMING CONTROL DEVICE

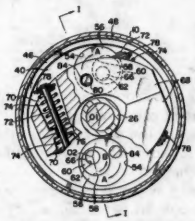
Shizuo Handa, Kariya, Japan, assignor to Nippondenso Co., Ltd., Kariya, Japan

Filed Mar. 26, 1984, Ser. No. 593,310

Claims priority, application Japan, Mar. 26, 1983, 58-50742

Int. Cl.⁴ F02M *59/20, 39/00*

U.S. Cl. 123—501 **14 Claims**



1. A device attachable to the cam shaft of a fuel injection pump for an internal combustion engine for controlling injection timing of the pump, comprising:

a cup-shaped cover open at one end and closed at the other by an end wall portion, said cover having a hole formed concentrically with the axis of said cover in said end wall portion and a driven gear disposed concentrically with said axis on the outside end face of said end wall portion for rotatably driving said cover around said axis when in mesh with a drive gear rotated by the engine;

a hub disposed concentrically with said axis and rotatable relative to said cover, said hub including a pipe-shaped boss portion whose outer diameter is not larger than said hole, said boss portion having at one open end a connecting portion for detachable connection to the cam shaft and a flange integrally formed on the outer periphery of said boss portion, said flange being axially spaced from said boss portion open by a predetermined distance and having a side face slidably contacting the inner surface of said end wall portion of said cover;

means for adjusting the phase angle of said hub to the rotation of said cover in response to an operating state of the engine, said adjusting means including phase angle adjusting members rotatably disposed in said flange, and a pair of flyweight plates received in said cover and displaceable radially outwardly by contrifugal force, each of said flyweight plates having one side face slidably contacting the other side face of said flange; and

a thrust plate disposed in said cover in the vicinity of said cover open end and being in contact with the other side face of said flyweight plates such that said thrust plate bears the thrust load of said plates.

4,572,145

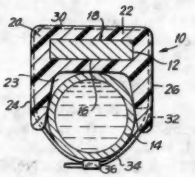
MAGNETIC FUEL LINE DEVICE

John Mitchell, Palm Springs, Calif., and Charles E. Ament, Rye, N.Y., assignors to Ament Enterprises, Inc., Rye, N.Y.

Continuation of Ser. No. 638,527, Aug. 6, 1984, abandoned, which is a continuation of Ser. No. 471,999, Mar. 4, 1983, abandoned. This application Dec. 11, 1984, Ser. No. 680,585

Int. Cl.⁴ F02B *75/10*

U.S. Cl. 123—538 **6 Claims**



1. A device positionable adjacent a fuel line of a fuel consuming apparatus for acting on fuel flowing therein for increasing the fuel efficiency of said apparatus and for reducing pollution emissions therefrom, said device comprising:

a housing comprising a body of non-magnetic material, said housing defining a longitudinally extending passage for receiving said fuel line;

means for securing said housing to said fuel line;

a magnet formed from a magnetic material magnetized with one pole on one longitudinal face thereof and the other pole on the opposite longitudinal face thereof, said magnet being embedded in said body of non-magnetic material in said housing with one of said poles adjacent and parallel to said longitudinally extending passage for positioning said one of said poles adjacent and parallel to one side of said fuel line when said device is secured thereto, there being no other magnets disposed about said fuel line between the end faces of said magnet.

4,572,146

DEVICE FOR INJECTING FUEL IN COMBUSTION CHAMBERS

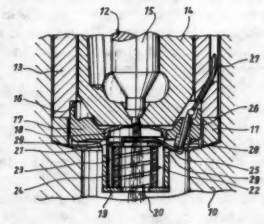
Werner Grünwald, Gerlingen; Ernst Imhof, Munchingen; Iwan Komaroff, Regensburg; Rolf Mayer, Winnenden-Schelmenholz, and Gunther Schmid, Stuttgart, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jan. 25, 1985, Ser. No. 695,034

Claims priority, application Fed. Rep. of Germany, Apr. 14, 1984, 3414201

Int. Cl.⁴ F02B *9/08*

U.S. Cl. 123—549 **13 Claims**



1. A device for injecting fuel into combustion chamber of self-igniting internal combustion engines, comprising a fuel injection nozzle which generates a fuel spray in accordance

with the operating cycle of the engine, an air guide device in proximity to said fuel injection nozzle and through which the fuel spray aspirates combustion air in the manner of a jet pump, said combustion air arranged to surround the fuel spray with an air envelope, a heating device having a length and spaced axially from said fuel injection nozzle said heating device further comprising a heating element having predetermined regions, the heat generation of said heating device being distributed over said length in such a manner that a different temperature prevails in an intermediate region from that in adjacent regions and further that said heating element is embodied as a resistance heating element through which electric current flows, the heating resistance of said element being higher in said intermediate region than in said adjacent regions.

4,572,147

AIR FILTRATION

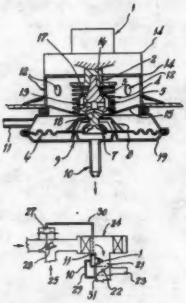
Robert S. Gladstone, Abergavenny, Wales, assignor to Coopers Filters Limited, Manchester, England

Filed Sep. 13, 1984, Ser. No. 650,081

Claims priority, application United Kingdom, Sep. 14, 1983, 8324598

Int. Cl.⁴ F02M *31/00*

U.S. Cl. 123—556 **7 Claims**



1. An air temperature control device for proportioning the quantity of ambient and preheated air to the air intake system of an internal combustion engine, said device comprising housing means having defined therein first, second and third chamber spaced apart by first and second internal wall means, said first chamber being defined by the area between the housing and the first wall, the second chamber being defined by the area between the first and second walls, and the third area defined by the area between the housing and the second wall, the first of which is rigid and the second of which is flexible, each chamber having a port defined in said housing for external communications, said first chamber having thermo-responsive actuator means responsive to air temperature in said air intake system, first valve means operable to bias said actuator means between two positions in the first of which said valve means closes a first bleed passage through said rigid wall between said first and second chambers, and in the second of which said bleed passage is open, together with second valve means progressively operable by said first valve means on approaching its second position, said second valve means being biassed to constitute a one way valve closing a bleed passage defined in said flexible wall, whereby until said actuator operates to open said first bleed passage, air may be drawn from the external communication port of the third chamber through said one way valve only from the external communication port of the second chamber, said flexible wall responding to the relative pressure difference between said second and third chamber to at least in part regulate said difference in accordance with the air temperature sensed by said actuator means a source of vacuum being provided by the air intake manifold, said source of vacuum being supplied to said device through one said ports, said device also being connected through another of said ports to a vacuum motor which is operable through means associated therewith to proportion the quantity of ambient and preheated air to the air intake system.

4,572,148

DIESEL INTERNAL COMBUSTION ENGINE

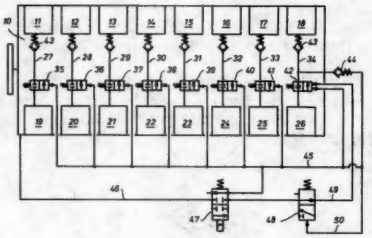
Herbert Deutschmann, Friedrichshafen; Erhard Schmidt, Oberteuringen, and Gerd-Michael Wolters, Markdorf, all of Fed. Rep. of Germany, assignors to MTU Motoren- und Turbinen-Union Friedrichshafen GmbH, Fed. Rep. of Germany

Filed Jul. 11, 1984, Ser. No. 629,582

Claims priority, application Fed. Rep. of Germany, Jul. 14, 1983, 3325393

Int. Cl.⁴ F02B *33/02*

U.S. Cl. 123—559 **4 Claims**



1. An exhaust gas turbocharged diesel internal combustion engine having a relatively low compression ratio, comprising cylinder means, several of said cylinder means which operate as engine cylinders during the starting and in the partial load operation, being charged by at least an equal number of cylinder means operating as compressor cylinders by way of connecting lines operable to be closed off by valve means, and control means for actuating said valve means, said control means being operable to control the connecting lines by the supplied charging air of at least one compressor cylinder corresponding to the operating condition of the internal combustion engine.

4,572,149

AIR/FUEL RATIO CONTROL SYSTEM FOR AN INTERNAL COMBUSTION ENGINE

Shumpei Hasegawa, Niiza; Michitaka Shiraiwa, Kamifukuoka, and Sadatomo Tsuchiya, Wako, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 18, 1984, Ser. No. 601,535

Claims priority, application Japan, Apr. 28, 1983, 58-075463

Int. Cl.⁴ F02B *3/00*

U.S. Cl. 123—589 **4 Claims**

1. An air/fuel ratio control system for an internal combustion engine provided with a three-way catalytic converter in the exhaust system, comprising:

an air/fuel ratio signal generating means responsive to rich and lean conditions of the air/fuel ratio in a composition of an exhaust gas of the engine for producing an air/fuel ratio signal representing said air/fuel ratio;

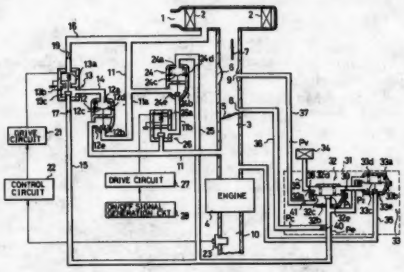
a first fluid supply passage connected to the engine for supplying one of a secondary air and a supplemental fuel to the engine;

a second fluid supply passage connected to the engine for supplying said one of the secondary air and the supplemental fuel to the engine;

a control valve disposed in the first fluid supply passage for controlling the amount of the fluid flowing through the first fluid supply passage;

a control means for controlling an opening degree of said control valve to cause a sectional area of the first fluid

supply passage to be gradually increased or decreased in accordance with said air/fuel ratio signal; and



an open/close valve disposed in said second fluid supply passage, for intermittently opening and closing said second fluid supply passage at predetermined time intervals and without regard to said air/fuel ratio signal.

4,572,150

ENGINE INCLUDING MEANS FOR RETARDING SPARKING OPERATION TO CONTROL ENGINE OVERSPEED

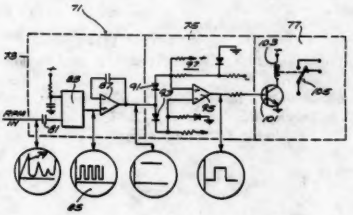
Leslie W. Foster, Wayzata, Minn., assignor to Outboard Marine Corporation, Waukegan, Ill.

Continuation of Ser. No. 415,340, Sep. 7, 1982, Pat. No. 4,448,179, which is a continuation-in-part of Ser. No. 309,857, Oct. 8, 1981, abandoned. This application May 4, 1984, Ser. No. 607,193

The portion of the term of this patent subsequent to May 15, 2001, has been disclaimed.

Int. Cl.[4] F02P *5/04, 1/00, 3/06*

U.S. Cl. 123—602 **2 Claims**



1. An internal combustion engine comprising means for providing a potential capable of producing a spark when applied to a spark plug, and means selectively operable for applying said potential to a spark plug so as to selectively produce sparks at normal and retarded timing relative to top dead center and comprising a rotatable member, first trigger means mounted adjacent to said member for generating a first signal which is effective to cause sparking operation of said spark plug at a normal timing, second trigger means mounted adjacent to said member in angularly spaced relation to said first trigger means and operable to generate a second signal which is effective, when said first signal is prevented from causing sparking operation, to cause sparking operation of said spark plug at a retarded timing, and means coupled to said first trigger means and operative in response to engine rotation above a given speed for preventing operation of said first trigger signal to cause sparking operation, whereby said second signal is effective to cause sparking operation at the retarded timing.

4,572,151

IGNITION SYSTEM FOR INTERNAL COMBUSTION ENGINES

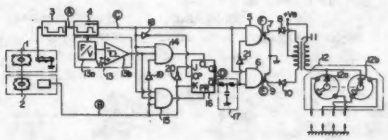
Koichi Toyama, Kariya, Japan, assignor to Nippondenso Co., Ltd., Kariya, Japan

Filed Jul. 27, 1984, Ser. No. 635,180

Claims priority, application Japan, Aug. 4, 1983, 58-143345; Oct. 14, 1983, 58-193243

Int. Cl.[4] F02P *15/08*

U.S. Cl. 123—622 **7 Claims**



1. An ignition system for an internal combustion engine comprising:

at least one ignition coil having a plurality of primary coils corresponding respectively to individual cylinders of said internal combustion engine;

basic ignition signal detector means for producing basic ignition signals in synchronism with rotation of said engine;

ignition control means for receiving said basic ignition signals as input signals thereto and producing an ignition control signal having a controlled predetermined pulse width;

basic cylinder discriminating signal detector means for producing a basic cylinder discriminating signal having a period twice that of said basic ignition signals in synchronism with rotation of said engine;

cylinder discriminating signal forming means for receiving said ignition control signal and said basic cylinder discriminating signal as input signals thereto and forming a cylinder discriminating signal comprising said basic cylinder discriminating signal with starting time of pulses thereof shifted to coincide respectively with trailing edges of pulses of said ignition control signal, which trailing edges correspond to ignition time of said engine; and

energization signal forming means for generating an energization signal which controls energization of said primary coils of said ignition coil for respective of said engine cylinders in accordance with said cylinder discriminating signal and said ignition control signal.

4,572,152

AIR GUNS WITH FLOATING PISTON RECEIVED IN COMPENSATING CHAMBER WHICH IS FORMED IN MAIN PISTON

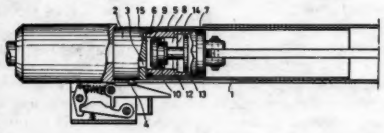
Sigfrid M. Olofsson, Syrenvägen, 7, S-45500 Munkedal, Sweden, and Chester H. Wickenberg, 85, S. Crystal, Elgin, Ill. 60120

Filed Oct. 6, 1982, Ser. No. 433,098

Claims priority, application Spain, Oct. 7, 1981, 506.667; May 19, 1982, 513.092

Int. Cl.[4] F41B *11/00*

U.S. Cl. 124—69 **4 Claims**



1. An improved air gun, comprising:

a main air compression chamber constructed and arranged

with a main air compression piston slidingly received therein to provide compressed air;

a mechanical means connected with said main air compression piston, for permitting an air gun user to mechanically force the main air compression piston slidably along in said main air compression chamber so as to compress air therein;

a gun barrel;

a passageway arranged for communicating said gun barrel with said main air compression chamber for propelling a pellet along said gun barrel;

a valve means constructed and arranged in said passageway for selectively closing-off communication of said main air compression chamber by operation of said mechanical means, for release into said gun barrel through said passageway when firing of a pellet is wanted;

a compensating chamber having a floating piston slidingly received therein;

an air seal formed between said floating piston and said compensating chamber, forming an air chamber which is normally separated by said air seal and said floating piston from said main air compression chamber;

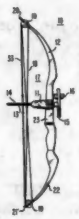
means arranging said air chamber of said compensating chamber in respect to said main air compression chamber for enabling said air chamber to receive and transmit variations in pressure with respect to said main air compression chamber by sliding movement of said floating piston, including said compensating chamber being formed in said main air compression piston, whereby air is rapidly transferred between said main air compression chamber and said compensating chamber in a compression phase of firing a pellet from said air-gun upon opening of said valve means, resulting in more progressive and regular action of compressed air on the pellet being fired.

4,572,153

COMPOUND BOW DRAW POSITION INDICATING DEVICE

Donald H. MacPherson, 675 Ocean Ave., West End, N.J. 07740

Filed Sep. 29, 1982, Ser. No. 428,200
Int. Cl.[4] F41B 5/00
U.S. Cl. 124—88 **9 Claims**



1. A bow draw position indicating device for mounting to a compound bow, said bow having a bowstring between the nock ends of the bow riser and having compound cables between the upper and lower ends of said bow, said device comprising

means for mounting said bow drawn positioning indicating means to said bow,

means for maintaining said cables of a bow to which said device is mounted out of the line of travel of said bowstring of said bow to which said device is mounted when the bowstring is released from the drawn position,

electrical contact means positioned along said maintaining means for providing a signal when closed, and

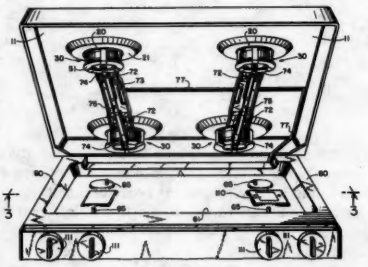
cable positioning means on said positioning means adapted to close said electrical contact means only when said cables of a bow to which said device is mounted have moved to a certain preestablished point along said maintaining means.

4,572,154

GAS RANGE

Ronald D. Schweitzer, Mansfield, Ohio, assignor to The Tappan Company, Mansfield, Ohio

Filed May 11, 1984, Ser. No. 609,356
Int. Cl.[4] F24C 3/00
U.S. Cl. 126—39 E **12 Claims**



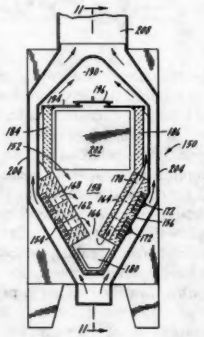
1. A gas range having a range top with at least one aperture, a burner, means for separately releasably holding said burner to said range top in said aperture and defining the sole support of said burner, a burner box beneath said burner, said burner having an aperture on the underside thereof for receiving gas to be burnt, and a gas orifice mounted in said burner box below said burner and spaced vertically directly below the aperture of said burner without air shutter means therebetween, for directing gas into said aperture and gas supply tubing means located solely outside of said burner box and connecting means for connecting said gas supply tubing means to said gas orifice means outside of said burner box.

4,572,155

CONVERGENT FLOW STOVE

David W. Engblom, 928 N. Kaspar Ave., Arlington Heights, Ill. 60004

Continuation-in-part of Ser. No. 605,072, Apr. 30, 1984, abandoned. This application Nov. 1, 1984, Ser. No. 667,083
Int. Cl.[4] F24B 5/00
U.S. Cl. 126—76 **6 Claims**



1. An apparatus for burning combustible solid organic material such as wood in a environment in which combustion is directed downwardly, comprising

a. a fuel chamber having a closed upper portion and a major

dimension in the vertical direction such that said fuel chamber is generally upright,

b. a combustion zone in the lower portion of said fuel chamber defined by a convergent outflow passage at the bottom of said fuel chamber and a pair of walls on opposite sides of said lower portion, said walls being sloped inwardly toward one another at said outflow passage, and said outflow passage comprising a gap between said walls,

c. a hearth element forming each said sloping wall, said hearth element including

i. at least one row of a plurality of spaced slots extending into the interior of said hearth element and a lateral air inlet channel connected to the slots of each row and a source of combustion air, and

ii. a flue outlet communicating with said outflow passage, said flue outlet including a plurality of spaced, parallel tubes in said hearth element, with said tubes being juxtaposed said slots and extending perpendicular to said air inlet channels,

d. means connected to said flue outlet to permit exhaustion of flue gases from said apparatus, and

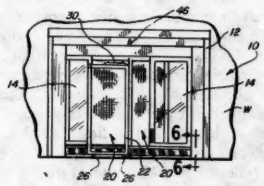
e. means for loading fuel into said fuel chamber.

4,572,156

FIREPLACE SCREEN ASSEMBLY

William L. Lentz, Chattanooga, Tenn., assignor to De Soto, Inc., Chattanooga, Tenn.

Filed Sep. 25, 1984, Ser. No. 654,225
Int. Cl.[4] F24C *15/02*
U.S. Cl. 126—140 **10 Claims**



1. A fireplace screen assembly having a frame assembly, glass doors moveably mounted on said frame assembly for providing access to a fireplace area, and a pair of mesh doors having rollers mounted thereon and being slidably mounted for rolling movement relative to said frame assembly, and means for opening said mesh doors automatically, said means for automatically opening said mesh doors comprising,

a latch member mounted on each said mesh door comprising a guide portion for guiding said mesh door for sliding movement on said frame assembly,

a spring latch mounted for movement on said frame assembly for movement relative to said frame assembly and normally in engagement with said latch members to prevent opening of said mesh doors,

operator means accessible from the front of said screen assembly for moving said spring latch out of engagement with said latch member, and

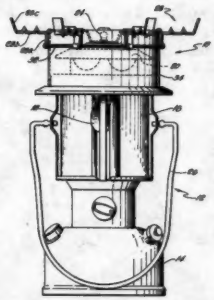
weight means secured to said mesh doors for automatically rollingly moving said mesh doors outwardly to full open positions when said operator means moves said spring latch out of engagement with said latch members, and wherein each said latch member defines a latching surface and said spring latch comprises spring means for biasing said spring latch into engagement with said latching surfaces.

4,572,157

STOVE ADAPTER FOR LANTERN

David Napier, P.O. Box 311, Roark, Ky. 40979

Filed Jul. 23, 1984, Ser. No. 633,577
Int. Cl.[4] F24C *5/04*
U.S. Cl. 126—258 **14 Claims**



1. A stove adapter for attachment to a camping fuel lantern including a bail, comprising:

a substantially cylindrical base member including an upper cooking surface;

means for attaching said base member to the lantern; and

a plurality of substantially S-shaped extension arms pivotally connected to said base member; said arms extending outwardly from said base member when extended to assume an open position to enlarge said cooking surface; said arms pivoting inwardly to overlie said upper cooking surface of said base member to assume a retracted position to allow the bail to swing overhead for carrying the combined lantern and stove apparatus; and

wherein each of said S-shaped extension arms comprises three portions; the first portion adjacent the pivotal connection of said extension arm to said cylindrical base member extending upwardly substantially perpendicular to said cooking surface when said extension arm is in said retracted position so as to provide an inner stop for maintaining cookware on the stove apparatus, said first portion extending downwardly substantially perpendicular to said cooking surface when said extension arms are in the open position so as to engage the cylindrical base member in a longitudinal direction and support said arms; the second portion overlying said cooking surface when in the retracted position and extending radially outwardly from said base member in the same plane as said cooking surface when in the open position so as to provide an enlarged cooking surface; and the third portion connecting to said second portion at an end opposite said first portion and extending upwardly when said extension arm is in the open position so as to provide an outer stop for maintaining cookware on the stove adapter.

4,572,158

TRIGGER TO ACTIVATE AQUEOUS SALT SOLUTION FOR USE IN A HEAT PACK AND METHOD OF MAKING THE SAME

Marc F. Fiedler, Los Angeles, Calif., assignor to Topazon Limited, Hong Kong, Hong Kong

Filed Sep. 12, 1984, Ser. No. 650,237
Int. Cl.[4] F24J *1/00*
U.S. Cl. 126—263 **9 Claims**

1. A trigger to initiate crystallization of an aqueous salt solution, said trigger being in contact with said solution and said solution and trigger being confined within flexible container forming a heat pack wherein during crystallization the crystallization solution gives off heat from the exothermic

reaction and the heat pack may be used for applying heat to the body where desired, said trigger comprising:

a thin wafer of metalic material having an external perimeter, said wafer including at least one activator cut extending through the thickness of said wafer and positioned inwardly of said exterior perimeter;

said activator cut including a first elongated slit formed by two opposed facing edges that are minutely spaced one from the other, said first slit including opposed terminus points, at least one minor slit at one or the other of said

terminus points, and including at least one minor slit at one or the other of said terminus points angularly disposed thereto, wherein said minor slit is formed by two opposed facing edges that are minutely spaced one from the other, said minor slit communicating with said first elongated slit and said minor slit ending in a minor terminus activator point in said wafer: and

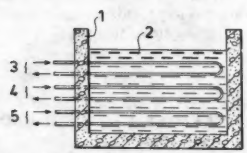
said wafer having two positions between which it is bendable by finger pressure with snap displacement causing the minor terminus activator point to minutely initiate crystallization of said aqueous salt solution.

4,572,159

TEMPERATURE STABILIZED SOLAR RESERVOIR

Lars-Olof Södergren, Stockholm, and Conny Ryytty, Bandhagen/Stockholm, both of Sweden, assignors to RyBro Handelsbolag, Bandhagen, Sweden

Filed Jun. 14, 1984, Ser. No. 620,468
Claims priority, application Sweden, Jun. 20, 1983, 8303536
Int. Cl.[4] F24J *3/02*
U.S. Cl. 126—415 **22 Claims**



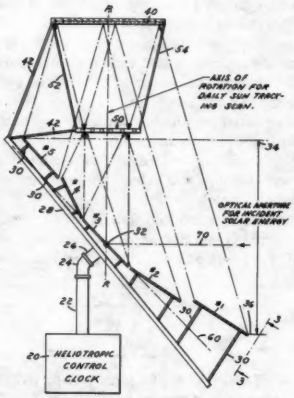
1. A temperature stabilized solar reservoir for entrapping sunlight and storing solar energy, including a vessel (1) with a bed of a heat storage medium (2) provided with gelling agent, and means (3,4,5) for extracting heat from the bed, characterized in that the heat storage medium is pigmented and that the pigmentation is such that the temperature of the medium is substantially constant measured in a direction downwards towards the bottom of the reservoir.

4,572,160

HELIOTROPIC SOLAR HEAT COLLECTOR SYSTEM

Wendell A. Blikken, and Marguerite A. Blikken, both of 952 S. Grove St., Ypsilanti, Mich. 48197

Filed Dec. 24, 1984, Ser. No. 686,075
Int. Cl.[4] F24J *2/10*
U.S. Cl. 126—439 **3 Claims**



1. A solar energy collector which comprises:

(a) a two-sided collector panel,

(b) a secondary reflector panel positioned adjacent said collector panel, and

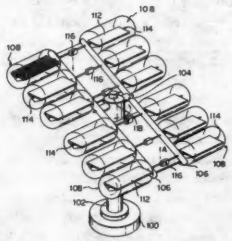
(c) an array of flat primary reflector panels respectively positioned to direct incoming solar energy in the direction of said collector panel and said secondary reflector panel, a first series of adjacent primary reflector panels centrally of said array being arranged in a generally two-dimensional parabolic assembly to direct incoming rays to a first side of said collector panel, and a second series of primary reflector panels bordering said first series being disposed to direct incoming rays past said collector panel to said secondary reflector panel positioned on the other side of said collector panel to direct reflected rays to said other side of said collector panel.

4,572,161

SOLAR RAY COLLECTOR DEVICE

Kei Mori, 3-16-3-501, Kaminoge, Setagaya-Ku, Tokyo, Japan

Filed Jun. 18, 1984, Ser. No. 621,588
Claims priority, application Japan, Jun. 24, 1983, 58-114767
Int. Cl.[4] F24J *3/02*
U.S. Cl. 126—440 **7 Claims**



1. A solar ray collector device for use in a equatorial zone comprising a post rotatable about a first axis, means for rotat-

ing said post, a framework, framework mounting means mounting said framework on said post, said framework mounting means comprising a shaft rotatable about a second axis which is perpendicular to said first axis, said shaft being mounted on said post so that said shaft rotates with said post about said first axis, said framework being mounted on said shaft to provide for rotation of said framework about said second axis, said first axis being a vertical axis and said second axis extending in a north-and-south direction, framework drive means for rotating said framework about said second axis, a plurality of collector units mounted on said framework, each of said collector units having a transparent housing and a collector assembly mounted in said housing, rotatable mounting means mounting each of said collector assemblies on said framework for rotation about collector axes parallel to said second axis, collector drive means for rotating said collector assemblies about said collector axes, said transparent housings each having at least a partial cylindrical configuration with the axis of the cylinder extending parallel to said second axis, the sunlight being admitted into said housing to be collected by said collector assemblies without being totally reflected by the surface of said housing, said collector drive means rotating said collector assemblies about said collector axes to direct said collector assemblies toward the sun as the latter passes overhead from east to west, said framework drive means rotating said framework about said second axis to allow said collector devices to collect solar rays without shading one another, whereby, when used in an equatorial zone, solar rays of the equatorial zone sun will be admitted into said housing without being reflected by the surface of the housing even when said axes of said at least partial cylindrical surfaces are disposed horizontally in a north-and-south direction.

4,572,162

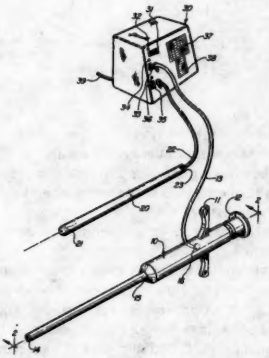
METHOD FOR THE DETECTION, LOCATION AND EXTRACTION OF AN INTRAUTERINE DEVICE

Billy R. Livesay; Howard J. Tatum, both of Atlanta, Ga., and Melvin R. Toews, Oakville, Canada, assignors to Ortho Pharmaceutical (Canada) Ltd., Don Mills, Canada

Filed Jan. 23, 1984, Ser. No. 573,073

Int. Cl.[4] A61F *5/46*

U.S. Cl. 128—1 R **11 Claims**



1. A method for the detection, location and extraction of an intrauterine device having a magnetic portion located in a projecting portion of the device, which comprises the steps of:

a. inserting into the uterus of a patient a probe comprising a grasping means and at least two Hall effect generators disposed perpendicularly to each other in electrical connection with an indicator means which responds to the output voltage of the Hall generators:

b. sensing the location of the magnetic portion with the probe,

c. adjusting the position of the probe in response to the indicator means until the probe is in close proximity to the intrauterine device;

d. actuating the grasping means to grasp a portion of the intrauterine device within the uterus; and

e. extracting the probe together with the intrauterine device from the uterus.

4,572,163

VALVE BODY FOR ENDOSCOPE

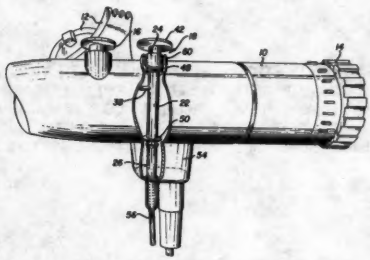
Ian P. Collins, Welwyn, and William J. Revell, Great Dunmow, both of England, assignors to Warner-Lambert Technologies, Inc., Dallas, Tex.

Filed Nov. 13, 1984, Ser. No. 670,860

Claims priority, application United Kingdom, Dec. 11, 1983, 8330240

Int. Cl.[4] A61B *1/06*

U.S. Cl. 128—4 **9 Claims**



1. A valve body for an endoscope, the body being moulded from a synthetic plastics material and having a straight through bore with a side port, one end of the through bore being open to receive a valve member which is slidable in the bore to control communication between the other end of the bore and the side port, and the valve body having spaced formations on respective sides of the side port for locating the valve body with respect to a casing of the endoscope, whereby when the valve body is fitted to the casing the valve body extends completely therethrough.

4,572,164

LIGHT SOURCE DEVICE FOR ENDOSCOPE

Morihiko Yoshida, Omiya, Japan, and David H. Cooper, Saratoga, Calif., assignors to Fuji Photo Optical Co., Ltd., Saitama, Japan

Filed Aug. 14, 1984, Ser. No. 640,706

Claims priority, application Japan, Aug. 17, 1983, 58-150041

Int. Cl.[4] A61B *1/06*

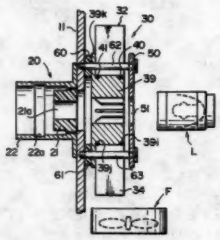
U.S. Cl. 128—6 **10 Claims**

1. A light source device for an endoscope, wherein a lamp is incorporated for supplying the light to a light guide fiber bundle for the illumination of said endoscope and heat radiating means is provided which is connected to said light guide fiber bundle for the illumination when said light guide fiber bundle is inserted for connection, characterized in that said heat radiating means comprises:

a plurality of radiator fins radially movable with respect to said light guide fiber bundle for the illumination; and

a resilient member or members for resiliently supporting said

plurality of radiator fins and biasing the same towards said light guide fiber bundle for the illumination through the



biasing forces thereof when said light guide fiber bundle for the illumination is inserted for connection.

4,572,165

HYDROKINETIC INJECTOR, PARTICULARLY FOR BALNEOTHERAPEUTIC APPLICATIONS

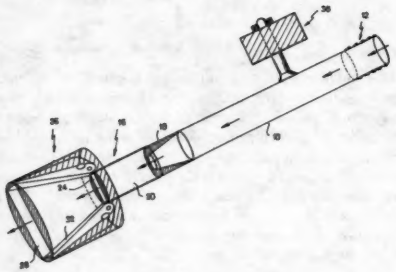
Jacques Dodier, 20, Allée Simone Weil, 35100 Bennes, France

Filed May 31, 1984, Ser. No. 615,735

Claims priority, application France, Dec. 3, 1982, 82 20285

Int. Cl.[4] A61H *9/00*

U.S. Cl. 128—24.1 **10 Claims**



1. A hydrokinetic injector intended in particular for balneotherapeutic applications, which comprises:

a cylindrical pipe (10) of substantially circular internal section, a first end (12) of which is equipped with means of connection to a water supply under a pressure of about 5.10^5 to about 10^6 Pa;

a frustoconical convergent member (18) disposed towards the second end (16) of the said pipe (10) and having a venturi coefficient substantially equal to 1.25;

a cylindrical expansion chamber (20) situated immediately downstream of the said frustoconical convergent member (18) and ending in an oblong rectangular window (24) forming a second constriction of the passage section, its venturi coefficient being substantially equal to 2, and

an injector head having a lamelliform internal chamber extending from the said oblong rectangular window (24) to the distal opening (28), the above defined elements so constructed and arranged relative to each other as to provide a pressurized cavitational water flow of quadrangular, lamelliform shape, infrasonic shock waves, and negative singlet oxygen ions.

4,572,166

SELF-TRAVELLING VIBRATION GENERATOR

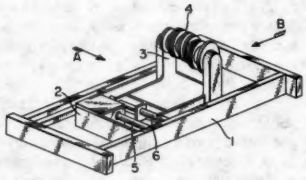
Kenichi Mabuchi, Matsudo, Japan, assignor to Bio Mabuchi Co. Ltd., Japan

Filed May 13, 1983, Ser. No. 494,371

Claims priority, application Japan, May 19, 1982, 57-84367; May 20, 1982, 57-85575

Int. Cl.[4] A61H *15/00*

U.S. Cl. 128—52 **6 Claims**



1. A self-travelling vibration generator having a travelling frame movably supported on parallel rails, a lifting/lowering frame with end leg portions rising at substantially right angles with respect to said travelling frame, a plurality of eccentric rollers provided off-center with respect to a roller shaft rotatably provided at the upper part of said lifting/lowering frame, and characterized in that an induction motor is used for the motor thereof for travelling said travelling frame, and a slide worm is provided in a mechanism for transmitting the output of said induction motor to said travelling frame to permit the load free rotation of said induction motor at the start of said induction motor.

4,572,167

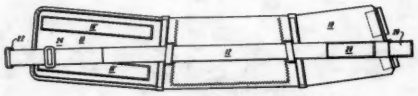
ORTHOPEDIC DEVICE AND PROCESS

Sumner Brunswick, 509 Ward St., Newton Centre, Mass. 02159

Continuation-in-part of Ser. No. 247,622, Mar. 25, 1981, abandoned. This application Oct. 6, 1983, Ser. No. 539,545

Int. Cl.[4] A61F *5/02*

U.S. Cl. 128—78 **9 Claims**



1. An improved orthopedic device for protecting and supporting a body portion, said device comprising

A. a web member having interior and exterior surfaces and comprising a resilient stretchable material and adapted to encircle a body portion,

B. a cinch member adapted for tightening the device about said body portion,

C. a pliable heat barrier attached to the interior surface of said web member and forming a pocket with said web member and having opposed pocket surfaces, and

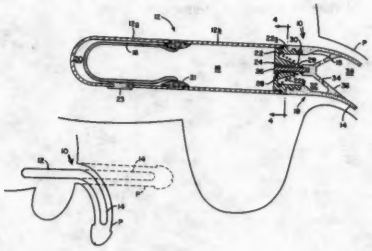
D. a preformed structural support panel adapted to removalby and replaceable fit into said pocket, said panel being of a material which is thermoformable at forming temperatures of between 220° F. and 375° F. and being substantially rigid and shape-retaining at ambient temperatures, said material being selected from a group consisting of copolymers, blends, grafts and alloys of acrylates, methacrylates, polycarbonates and polyvinyl chlorides, and wherein surfaces of said panel formed by said material are, when said panel is within said pocket, openly exposed to said opposed pocket surfaces.

4,572,168

FULLY IMPLANTABLE VAPOR PRESSURE ACTUATED PENILE ERECTION DEVICE AND METHOD

Robert E. Fischell, 1027 McCeney Ave., Silver Spring, Md. 20901

Filed Dec. 20, 1983, Ser. No. 563,455
Int. Cl.⁴ A61F *5/00*
U.S. Cl. 128—79 **21 Claims**



1. A penile erection prosthesis for implantation totally within the corpus cavernosum of the penis of a human male, the prosthesis comprising: a rigid root section outer casing for implantation in the root of the corpus cavernosum; a flexible pendulous section outer casing for implantation in the pendulous portion of the penis; a sealed, variable volume pressurant chamber located in said rigid root section; a pressurant filling said pressurant chamber, said pressurant being capable of changing state at normal body temperature between liquid and vapor in dependence upon the volume of said pressurant chamber and maintaining a positive pressure in said pressurant chamber; a root reservoir chamber located in said rigid root section, one wall of which is moved in dependence upon the volume of said variable volume pressurant chamber; a pendulous section chamber located in said pendulous section outer casing, said pendulous section chamber being in fluid communication with said root reservoir chamber; a working fluid filling said root reservoir chamber and said pendulous section chamber; actuating means for bringing the penis from a flaccid to an erect state by increasing the volume of said pressurant chamber and thereby forcing said working fluid from said root reservoir chamber to said pendulous section chamber, said increasing of volume being accomplished by permitting at least a portion of said pressurant to change from its liquid state to its vapor state; and means for returning the penis to its flaccid state.

4,572,169

REMOVABLE LOWER LEG BRACE

Donald M. Mauldin, and Richard E. Jones, III, both of Dallas, Tex., assignors to Kenneth D. Driver, Memphis, Tenn. and Melvin L. Stills, Lewisville, Tex.

Filed Apr. 3, 1984, Ser. No. 596,292
Int. Cl.⁴ A61F *3/00*
U.S. Cl. 128—80 H **10 Claims**

1. A brace for treatment of tibial fractures comprising:

a rigid shoe including a planar upper surface member for engaging the sole of the patient's foot, side walls extending perpendicularly to the upper surface and downwardly therefrom, and an outer sole member comprising the lowermost surface of the shoe;

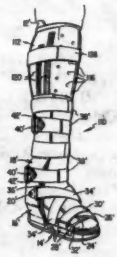
the outer sole of the shoe having a fulcrum, a planar first portion extending rearwardly from the fulcrum to the heel of the shoe and a second portion comprising a continuous curve extending from the fulcrum upwardly and forwardly to the toe of the shoe;

means for locating the foot of the patient on the planar upper surface of the shoe with the metatarsal point of the foot positioned forward of the fulcrum so that the shoe normally sets on the planar first portion of the outer sole and pivots about the fulcrum onto the curved second portion as the weight of the patient shifts forward of the metatarsal point of the foot;

said rigid shoe further comprising a molded plastic body portion having the planar upper surface member and the outer sole member secured thereto and molded plastic left and right side members formed integrally with the body portion and positioned on opposite sides of the shoe;

the side members each comprising a first portion extending from the side wall of the shoe angularly upwardly and outwardly with respect thereto and a second portion extending upwardly from the upper end of the second portion substantially parallel to the side wall of the shoe;

plastic side plates secured to the side members and each including an attachment portion secured to the second portion of its respective side member, a second portion



extending from the upper end of the attachment portion angularly upwardly and inwardly with respect thereto, and a third portion extending upwardly from the upper end of the second portion generally parallel to the second portion of the side member and to the attachment portion of the side plate;

the third portion of each side plate positioned over the side wall of the shoe and being curved inwardly to conform to the calf of the patient;

each side member further including a layer of foam padding secured to the inside surface thereof and extending upwardly along the inner surfaces of the first and second portions of the side member;

an extension secured to the upper end of the third portion of the side plates and extending therefrom upwardly beyond the knee of the patient; and

fastening means for securing the shoe, the side members and the extension in place relative to the leg of the patient.

4,572,170

PREVENTIVE KNEE BRACE

Richard V. Cronk, 1175 NW. Overlook Dr., and Jean-Paul Nielsen, 445 NW. Eighth ST., both of Corvallis, Oreg. 97330

Filed Jun. 6, 1984, Ser. No. 617,693
Int. Cl.⁴ A61F *3/00*
U.S. Cl. 128—80 C **16 Claims**

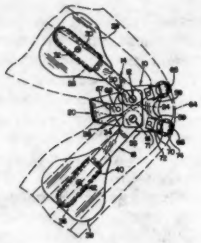
11. A single-sided preventive knee brace for athletic use comprising:

a rigid upper leg bar for extension along the outside of a thigh from the knee of a user,

a rigid lower leg bar for extension along the outside of the lower leg from the knee of a user,

a rigid clevis plate means for overlying the outside of the knee joint of a user and interconnecting adjacent ends of said upper and lower leg bars for independent movement about

polycentric parallel pivot axes extending through said plate means,



securing means for adjustably positioning said clevis plate means at the outside of the knee joint by encircling the joint above and below the knee cap.

4,572,171

POLYURETHANE FIXED DRESSINGS WHICH HARDEN IN THE PRESENCE OF MOISTURE

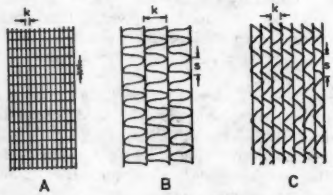
Christian Wegner, Cologne; Gottfried Schneider, Leverkusen, and Wolfram Mayer, Bergisch-Gladbach, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Mar. 17, 1983, Ser. No. 476,094

Claims priority, application Fed. Rep. of Germany, Mar. 30, 1982, 3211634

Int. Cl.[4] A61F *5/04*

U.S. Cl. 128—90 **10 Claims**



1. In a dressing material for the production of fixed dressings, comprising a raschel knit fabric carrier coated and/or impregnated with a resin which hardens in the presence of moisture and contains isocyanate groups, the improvement wherein the raschel fabric has a weight per unit area of about 40 to 150 g/m^2 and its construction is such that the ratio of the mean distance between two warp threads to the mean distance between two weft threads is less than about 1.5.

4,572,172

MOLDING CAST SYSTEM FOR FRACTURES OF THE HUMERUS AND OF THE RADIUS ULNA

L. Benton Williams, P.O. Box 916, Georgetown, S.C. 29440

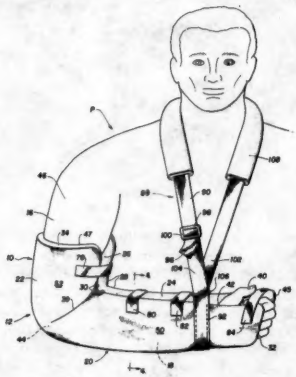
Filed Nov. 16, 1983, Ser. No. 552,414

Int. Cl.[4] A61F *5/40*

U.S. Cl. 128—94 **10 Claims**

1. A molding cast system for fractures of the humerus and of the radius and ulna of a patient, comprising, in combination,

a molding cast including a wall member defining connecting, approximately cylindrical first and second chambers, said wall member having a pair of opposed, spaced elongated side edge portions and a pair of first and second end edge portion intersecting said side edge portions, said first chamber being adapted to receive the under part and the side parts of the forearm of the patient between the hand area and the elbow area, said second chamber being adapted to receive the rear and side parts of the upper arm of the patient extending from the elbow area towards the shoulder area, said first end portion defining a first opening at the outer end of said first chamber and said second end edge portion defining a second first opening at the outer end of said second chamber, said elongated side edge portions defining an elongated aperture opening to said first and second chambers along the top part of said forearm and the forward part of said upper arm between said first and second openings;



said wall member including an inner layer of a flexible, porous material, a middle layer of a plurality of laminated layers of a casting material, and an outer layer of a flexible, soft, water absorbing and fast drying material;

means affixed to said side edge portions for adjustably and removably connecting said side edge portion across said aperture; and

means for adjustably supporting and positioning said molding cast, wherein said first chamber is maintained in a generally horizontal position and said second chamber is maintained in a generally vertical position.

4,572,173

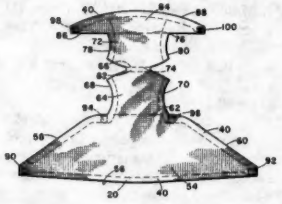
CLEAN CAP

Perry J. Comeau, Rte. 3, Box 15, Valley Dr., Searcy, Ark. 72143

Filed May 29, 1984, Ser. No. 614,567

Int. Cl.[4] A61F *13/00*

U.S. Cl. 128—132 D **6 Claims**



1. A cap for use on patients, such as during surgical procedures, to provide warmth and cleanliness comprising:

a unitary piece of flat flexible material defined by;

a first generally frustro-triangular portion having a generally straight first edge, equal length inwardly tapered sides and an imaginary second edge generally parallel the first edge;

a second generally rectangularly shaped portion, having an

imaginary first edge coinciding with said first portion imaginary second edge and having a second edge generally parallel and spaced from the first edge, and having opposed side edges;

a third generally rectangular portion having a first edge and an imaginary second edge and opposed side edges;

a fourth, flap portion of relatively small width and length integrally connection said second edge of said second portion and said first edge of said third portion;

a fifth generally triangular shaped portion having a first edge, the intermediate portion of which is coincident with said third portion imaginary second edge, and having an elliptical second edge; and

attachment means at the outer ends of said first portion first edge, at the ends of said first portion second edge, and at the ends of said fifth portion first edge, whereby the cap may be fit on the head of patient with said fifth portion extending around the neck of the patient, the third portion fitting on the lower back portion of the patients head, the second portion extending over the upper back portion of the patients head and said first portion fitting on top of the patient's head, the attachment means serving to hold the portions in assembled relationship on the patient's head.

4,572,174

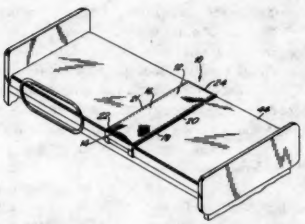
LOW FRICTION BED PAD

Kasriel Eilender, 305 E. 86th St., New York, N.Y. 10028, and Mille Stand, 2593 Sedgwick Ave., Bronx, N.Y. 10458

Filed Nov. 22, 1983, Ser. No. 554,260

Int. Cl.[4] A61B *19/00*; A47G *9/00*

U.S. Cl. 128—149 **14 Claims**



1. A composite pad for substantially preventing bed sores, said composite pad comprising:

an upper layer formed from a low friction flexible porous material;

a lower layer formed from a substantially impervious sheet material, said upper and lower layers being attached to one another to define a recloseable pouch therebetween; and

a lubricant disposed in said pouch, said lubricant being flowable through the porus upper layer thereby providing a low coefficient of friction between the upper layer and a skin surface adjacent thereto, whereby the low coefficient of friction substantially prevents bed sores on a patient supported on said upper layer of said composite pad.

4,572,175

MULTI-MODE DEMAND VALVE

Stephen D. Flynn, 255 Chartwell Rd., Oakville, Ontario, Canada

Filed Jul. 20, 1983, Ser. No. 515,621

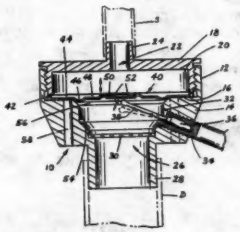
Int. Cl.[4] A01M *16/00*

U.S. Cl. 128—203.11 **12 Claims**

1. A multi-function valve for the administration of gases comprising:

housing means defining a valve chamber therein and having a pressurized gas inlet therein for delivery of gases to said chamber adapted for connection with a pressurized gas source, a gas administration opening therein for delivery of gases from said chamber to a patient adapted for connection with a suitable gas administration attachment and a resuscitation gas inlet therein for delivery of resuscitation gas to said chamber adapted for connection with a resuscitation gas source;

a diaphragm mounted across said chamber and sealed to said housing means to divide said chamber into upstream and downstream chamber portions, said resuscitation gas inlet positioned on the upstream side of said diaphragm and said pressurized gas inlet and said gas administration opening positioned on the downstream side of said diaphragm, said diaphragm being movable in response to pressure differences thereacross, said diaphragm having a central contact portion movable in unison therewith;



inlet valve means connected to said pressurized gas inlet for controlling flow of pressurized gas into said chamber;

valve operating arm means connected to said inlet valve means and extending therefrom into abutment with the contact portion of said diaphragm for operating said inlet valve means in response to movement of said diaphragm;

fluid flow opening means in said diaphragm for permitting fluid flow from said upstream side of said diaphragm to the downstream side thereof; and

exhalation means associated with said housing means and positoned on the downstream side of said diaphragm for discharge of exhaled gas from the patient to the atmosphere.

4,572,176

CONTROL FOR A PROTECTIVE MASK WHICH OPERATES WITH EXCESS INTERNAL PRESSURE

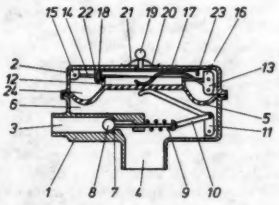
Hans-Joachim Walther, Lubeck, Fed. Rep. of Germany, assignor to Drägerwerk Aktiengesellschaft, Fed. Rep. of Germany

Filed Oct. 19, 1983, Ser. No. 543,317

Claims priority, application Fed. Rep. of Germany, Dec. 10, 1982, 3245717

Int. Cl.[4] A62B *7/04*

U.S. Cl. 128—204.26 **5 Claims**



1. A control for a protective mask which operates with excess pressure inside the mask, comprising a housing having a hollow interior, a control diaphragm extending across the hollow interior of said housing and dividing said housing into an outer chamber and a breathing chamber, a gas inlet extend-

ing into said breathing chamber for supplying breathing gas, a gas outlet extending from said breathing chamber to the exterior for delivering the breathing gas to the mask, a valve between said inlet and outlet, first spring means urging said valve to a closed position, a control lever pivotally mounted in said breathing chamber and having a control lever arm portion engageable with said control diaphragm and movable therewith and being connected to said valve for moving said valve against the force of said first spring means between open and closed positions in accordance with the movement of said control diaphragm, a pressure lever pivotally mounted in said outer chamber having an extending locking projection and a pressure lever arm portion which engages on said control diaphragm on the opposite side thereof from said lever, second spring means mounted in said outer chamber and bearing against said projection and thereby pivoting said pressure lever arm portion into contact with said diaphragm to apply a counteracting force to the diaphragm against the force of said first spring means, and a locking member movably mounted on said housing and extending into the outer chamber and engageable with said locking projection to pivot said lever arm portion out of engagement with said diaphragm thereby permitting said diaphragm to move to a position in which said control lever permits said first spring means to urge said valve to a closed position.

4,572,177

OXYGEN THERAPY APPARATUS

Brian L. Tiep, 632 Norumbega Dr., Monrovia, Calif. 91016; Robert E. Phillips, 12217 Iredell St., Studio City, Calif. 91601, and Ben A. Otsap, 7661 Airport Blvd., Los Angeles, Calif. 90045

Filed Jun. 25, 1984, Ser. No. 624,414
Int. Cl.[4] A61M *16/00*
U.S. Cl. 128—205.17 **16 Claims**

1. An apparatus which is primarily intended for use in oxygen therapy, said apparatus having a housing defining a gas holder therein, said housing including means interior thereof for providing a variable volume chamber capable of changing in volume in response to pressure resulting from the inhalation and exhalation of a person who is using said apparatus, a conduit means for conveying gas, an extremity of said conduit means being in communication with the interior of said variable volume chamber, the other extremity of said conduit means being adapted so as to receive expired air from said person and so as to be capable of supplying gas to said person and also provide a simultaneous flow of ambient air to and from said person, and supply means for supplying oxygen to said conduit means so that it will be supplied to said person during inhalation, said other extremity of said conduit means adapted to be spaced from the person so that expired air can be vented to the ambient during part of the exhalation cycle and so that ambient air can be inhaled during part of the inhalation cycle in which the improvement comprises:

said housing further including means defining a fixed volume chamber located adjacent to said variable volume chamber and opening means leading between said two chambers, said first mentioned extremity of said conduit means and said supply means both leading into said fixed volume chamber,

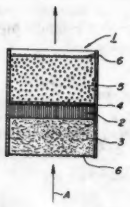
baffle means in association with said fixed volume chamber for directing oxygen from said supply means into said first mentioned extremity of said conduit means, said baffle means being shaped so that when said variable volume chamber is filled there is substantially no flow of oxygen into said chamber as oxygen flows from said supply means.

4,572,178

EMERGENCY MASK

Tsuneyoshi Takase, and Yoriyuki Hayashi, both of Shimonoseki, Japan, assignors to Toyo CCI Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 27, 1984, Ser. No. 594,972
Claims priority, application Japan, Apr. 1, 1983, 58-46741[U]; Apr. 1, 1983, 58-46742[U]; Apr. 1, 1983, 58-46745[U]
Int. Cl.[4] A62B *7/10*
U.S. Cl. 128—205.27 **17 Claims**



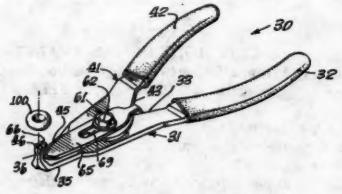
1. A canister for an emergency mask, the mask having a face piece adapted to come in contact with a respiratory face organ of a user, and a canister-holder airtightly holding the canister and airtightly coupled with the face piece so as to communicate therewith, said canister having a gas inlet opening and a gas flow passage extending through said canister from said gas inlet opening, and said canister containing a plurality of air-purifying agents in the form of respective layers each extending across said gas flow passage, said air-purifying agents being composed of, in succession along said passage and starting from said opening, in the order recited, a desiccant, a smoke-filter, an adsorbent, and a catalyzer of the oxidation of carbon monoxide, whereby said agents remove black smoke, white smoke, carbon monoxide, hydrogen chloride gas, chlorine gas, cyanic acid, ammonia, benzene, acrolein and other aldehydes, nitrogen oxides, and other noxious gases generated during fire.

4,572,179

APPARATUS FOR REMOVING SWINE TAILS

Jay M. Teitelbaum, and Henry S. Teitelbaum, both of 3840 S. Jason St., Engelwood, Colo. 80110

Filed Aug. 21, 1981, Ser. No. 294,939
Int. Cl.[4] A61B *17/00*
U.S. Cl. 128—303 A **1 Claim**



1. Apparatus for expanding an elastic ring comprising in combination: a first handle, a first peg attached to said first handle, a second handle, a second peg attached to said second handle, a slidable member, a third peg attached to said slidable

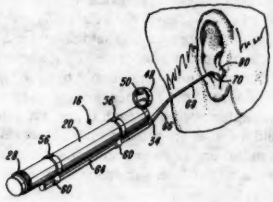
member, pivot means pivotally connecting the said first and second handles together and slidably connecting said slidable member to said handles in such manner that said first, second and third pegs lie in close proximity to one another so as to be insertable within the hole within the elastic ring, said first and second handles being elongated members which terminate at corresponding ends in hand-gripping portions, and further means cooperative with said slidable member and said first and second handles such that when the hand-gripping portions of said handles are moved toward one another, said third peg is moved away from the said first and second pegs and said first and second pegs are simultaneously moved away from one another, said first and second pegs being attached to the ends of said handles opposite from the hand-gripping portions of said first and second handles, said first handle having a flattened portion lying in a region between its hand-gripping portion and said first peg, said second handle also having a flattened portion lying in a region between its hand-gripping portion and said second peg, the flattened portions of said first and second handles being provided with openings therethrough for receiving said pivot means, said slidable member having a flat elongated plate portion, said third peg being positioned at the end of said flat plate portion which lies closest to said first and second pegs, said third peg projecting normal from said flat plate portion; said flat plate portion having an elongated slot through which said pivot means passes and said further means comprising a tab formed on said slidable member at the end of said flat plate portion opposite from said third peg, said tab projecting in a direction normal to said flat plate portion and opposite to the direction in which said third peg projects; edges formed on said first and second handles and facing each other to engage said tab as the hand-gripping portions of said handles are pivoted toward one another to slide said slidable member in a preselected direction that moves said third peg away from said first and second pegs for expanding said ring, and a spring bias means connecting said tab to said pivot means to bias said slidable member in a direction opposite to said preselected direction.

4,572,180

LIGHTED EAR CANAL CURETTE INSTRUMENT

R. Paul Deenadayalu, 298 Shadywood Dr., Dayton, Ohio 45415

Filed Nov. 17, 1983, Ser. No. 552,968
Int. Cl.⁴ A61B *17/22*
U.S. Cl. 128—304 **1 Claim**



1. A lighted ear canal/nasal passage cleaning instrument of the type provided with an elongate lighting member having a central axis and having a light emitting end portion from which light is emitted, the instrument also being of the type in which a magnification lens is attached to the elongate lighting member adjacent the light emitting end portion, the magnification lens extending laterally from the elongate lighting member and being angularly adjustable with respect to the elongate lighting member, the improvement comprising:

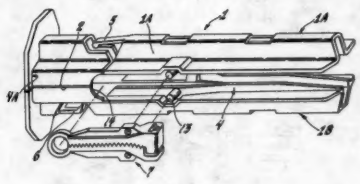
an elongate handle attached to the elongate lighting member and extending along the length thereof, the elongate handle being parallel to the elongate lighting member and in juxtaposition therewith, the handle having an end portion, a stem integrally attached to the end portion of the handle and extending angularly from the end portion of the handle, the stem also extending angularly from the lighting member, the stem having an end portion, a curette type engagement member integrally attached to the end portion of the stem, the curette type engagement portion extending angularly from the stem and positioned in alignment with the central axis of the lighting member.

4,572,181

CLAMPING/CUTTING APPARATUS

Martin Mattler, 3880 Franklin Rd., Bloomfield Hills, Mich. 48013

Filed Mar. 15, 1984, Ser. No. 589,765
Int. Cl.⁴ A61B *17/12, 17/32*
U.S. Cl. 128—305 **12 Claims**



1. An apparatus for clamping and severing an elongated member, comprising:

first means for clamping said elongated member;

second means for clamping said elongated member;

third means operably and releasably interconnected to said first and second means for maintaining said first and second clamping means in a predetermined side-by-side relationship and for moving said first and second clamping means to closed positions thereof wherein said elongated member is clamped by said first and second clamping means;

fourth means for severing said clamped elongated member upon movement of said fourth means relative to said third means, said fourth means operably cooperating with said third means so as to be positioned thereby in relation to said first and second clamping means; and

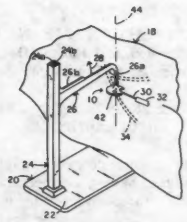
said fourth means being integrally provided with fifth means for disconnecting said first and second clamping means from said third means upon movement of said fourth means to sever said clamped elongated member.

4,572,182

NOTCHED PRESSURE PAD FOR AN ARTERY CLAMP

Suzanne M. Royse, Beaverton, Oreg., assignor to Instromedix, Inc., Beaverton, Oreg.

Filed Dec. 27, 1983, Ser. No. 566,169
Int. Cl.⁴ A61B *17/12*
U.S. Cl. 128—325 **4 Claims**



1. A pressure pad for use with an artery clamp at the conclusion of an arterial puncture procedure to facilitate clamping of

the arterial puncture site prior to withdrawal from the site of a puncturing implement, said pad comprising

a substantially disc-shaped base which includes a notch extending from the periphery of said base towards a central portion of said base, said notch having its largest width at said periphery, and

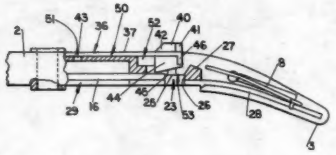
an integral mounting boss attached to said disc for mounting the pad on the artery clamp.

4,572,183

POSITIVE FEED SYSTEM FOR A SURGICAL LIGATING INSTRUMENT

Donald D. Juska, Winchester, Ohio, assignor to Senmed, Inc., Cincinnati, Ohio

Filed Nov. 26, 1984, Ser. No. 674,585
Int. Cl.[4] A61B *17/12, 17/10*
U.S. Cl. 128—325 **14 Claims**



1. A ligating instrument for applying clamping clips to blood vessels, said instrument comprising a first handle terminating at its forward end in a first jaw, a second handle and a second jaw both coupled to said first handle, said first and second handles being manually shiftable between open and closed positions, said first jaw being shiftable by said first handle and second jaw being shiftable by said second handle between open and closed clip-clamping positions, an elongated magazine, a row of clips located within said magazine, clip feed means mounted within a clip feed track, said clip feed track being parallel to and adjacent to said magazine and extending to the forward ends of said first and second jaws, said clip feed means being shiftable by said first and second handles between a retracted position removed from said jaws when said handles are in their closed positions and an extended clip-locating position between said jaws when said handles are in their open positions, passage means connecting said magazine and said clip feed track, and means for transferring each clip from the forward end of said magazine to said clip feed track via said passage means, said transfer means comprising a plunger normally located in an unactuated position adjacent said magazine, said plunger being shiftable by one of said jaws from said unactuated position to an actuated position within said magazine to shift said forwardmost clip through said passage means into said clip feed track upon closing of said handles whereby said forwardmost clip can be delivered to said forward ends of said first and second jaws by said clip feed means when said handles return to said open position.

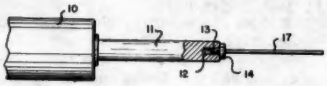
4,572,184

WAVE GUIDE ATTACHMENT MEANS AND METHODS

Clark E. Stohl, Lakewood, and Eugene DeCastro, Jamestown, both of N.Y., assignors to Blackstone Corporation, Jamestown, N.Y.

Filed Oct. 28, 1983, Ser. No. 546,330
Int. Cl.[4] A61B *17/00*
U.S. Cl. 128—328 **11 Claims**

1. In combination a transducer, wave guide and attachments comprising a transducer having a concentrator horn attached thereto at one end, a threaded opening in said horn at the opposite end thereof, a screw member having a tool engageable head for threading said screw member into the threaded opening in the horn, a single wave guide, an axial passage through the screw providing a slip fit with the single wave guide, a recess around the passage at the end opposite the tool engaging head and a solidified fastening mass around one end



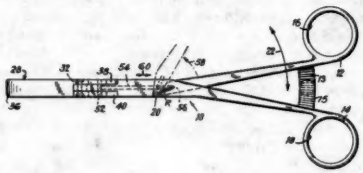
of the wave guide in said recess fixing the said end of the wave guide therein.

4,572,185

NONPLANAR SURGICAL NEEDLE HOLDER AND RELATED SUTURING METHOD

Mark Rich, 111-56 76 Dr., Apt. C2, Forest Hills, N.Y. 11375

Filed Feb. 23, 1984, Ser. No. 582,835
Int. Cl.[4] A61B *17/06, 17/28*
U.S. Cl. 128—340 **18 Claims**



1. A surgical needle holder comprising first and second handle members in a first plane, first and second jaw members cooperatively associated in a second plane to constitute means for grasping and manipulating a surgical needle, and coupling means coupling said jaw and handle members so that the jaw members are relatively pivotal about a first pivot axis which is angularly disposed to a second pivot axis on which the handle members are relatively pivotal and so that the jaw members pivot relative to each other in response to a relative pivoting of said handle members, said jaw members and handle members being related to each other such that, when said first plane is vertical, said second plane is at least substantially horizontal.

14. A method of surgical suturing wherein a curved needle is employed to sew together the edges of two tissue sections, said method comprising grasping said needle in a needle holder having jaws arranged to cooperate along a plane and handles coupled to the jaws and operable in a plane to open and close said jaws, said method further comprising arranging said planes at an angle relative to each other whereby to facilitate grasping said handles in a hand of a suturer and such that, when the handles are in a vertical plane, the jaws are parallel to a plane which is at least substantially horizontal.

4,572,186

VESSEL DILATION

Sheldon D. Gould, N. Miami, and Gary T. Riggs, W. Palm Beach, both of Fla., assignors to Cordis Corporation, Miami, Fla.

Filed Dec. 7, 1983, Ser. No. 558,910
Int. Cl.[4] A61M *29/00*
U.S. Cl. 128—341 **24 Claims**

1. A dilation catheter comprising:

an elonaged shaft having a proximal end and a distal end;

a mechanical dilation assembly near said distal end of the elongated shaft;

said mechanical dilation assembly including a radially and axially extending cylindrical recess, said cylindrical recess having an adjustable axial length;

a braided cylindrical member positioned generally within said cylindrical recess, said braided cylindrical member also having an adjustable axial length, said braided cylindrical member being structured such that elongation of its adjustable axial length decreases its radial size and such that reduction of its adjustable length increases its radial size; and

actuation means for elongating and reducing said adjustable axial length of the braided cylindrical member, said acuation means having control means near said proximal end of the elongated shaft.

4,572,187

ABRASION DEVICE

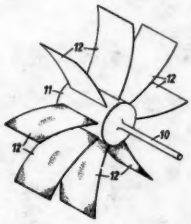
John R. Schetrumpf, 12, Ladbroke Sq., London, W. 11, England

Filed Mar. 6, 1984, Ser. No. 586,747

Claims priority, application United Kingdom, Mar. 11, 1983, 8306678

Int. Cl.⁴ A01B *17/00*

U.S. Cl. 128—355 **15 Claims**



1. A dermabrader comprising a rotary hub made of a material which is relatively inert in relationship to contact with skin or other body tissue, and a plurality of flexible strips having a single abrasive surface of high stability and which has no or little body tissue toxicity and is relatively non-allergenic, the strips being located and fixed with respect to the hub at or adjacent ends or edges of the strips to extend outwardly of the hub at locations around the periphery thereof with the abrasive surfaces of the strips facing in the same peripheral direction around the hub, each flexible strip being dimensioned in length and thickness to flex to a position substantially parallel to the surface to be abraded and remain out of contact with each other at the hub.

4,572,188

AIRFLOW COVER FOR CONTROLLING BODY TEMPERATURE

Scott D. Augustine, 4761 Olive St., San Diego, Calif. 92105, and Douglas J. Augustine, 414 Washington St., Sandstone, Minn. 55072

Filed Mar. 5, 1984, Ser. No. 586,554

Int. Cl.⁴ A71F *7/00*

U.S. Cl. 128—380 **10 Claims**

1. A cover for delivering a diffuse medium flow to a human body, comprising:

an inflatable cover housing including a plurality of inflatable hollow tubes, each tube having a rounded upper portion and a flattened lower portion, joined in a substantially parallel array to form a substantially smooth lower cover surface including said lower tube portions for facing a body to be covered and a quilted upper cover surface including said upper tube portions for facing away from said body;

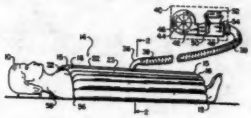
an entry port in said upper surface for admitting an inflating medium into said housing;

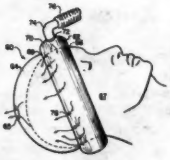
transverse openings connecting the interior of each tube with the interior of at least one other adjacent tube in said array for conducting an inflating medium into all of said tubes to inflate said housing; and

exit ports formed in the flattened portion of each of said tubes for, when said housing is inflated, permitting said medium to flow out of said housing through said smooth lower surface.

8. A cap for controlling the temperature of the head of a reclining person, comprising:

an inflatable annular tube forming a central opening for encirclingly fitting to the head of a person reclining on a support surface and for being inflated to lift said head from said surface;





a sheet of material attached to one side of said annular tube over said central opening to form a recess for receiving substantially the top of a head when said head extends into said recess through said central opening;

an outer surface on said tube;

an entry port on said tube outer surface for admitting a temperature-controlled, inflating medium into said tube;

an inner surface in said tube's central opening;

exit ports in said inner surface for, when said tube is inflated with an inflating medium, conducting said inflating medium from said tube into said recess; and

an exit port, substantially smaller than said central opening, in said material sheet for venting an inflating medium from said recess to an external environment.

4,572,189

ELECTRONIC CONTROLLER FOR USE WITH A SURGICAL LASER SYSTEM

Chadwick F. Smith, 1127 Wilshire Blvd., Los Angeles, Calif. 90017, and Walter E. Johansen, III, 11661 San Vicente Blvd., both of Los Angeles, Calif. 90049

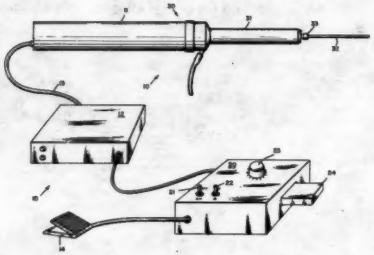
Filed Oct. 11, 1983, Ser. No. 540,299

Int. Cl.⁴ A61N *5/06*

U.S. Cl. 128—395 **2 Claims**

1. A combination of an electronic controller and a laser system which includes a mechanical triggering device and which generates a beam of light energy in the infrared spectrum and which is electrically coupled to said electronic controller so that said electronic controller not only controls the pulse width of said beam of light energy within a range of 0.005 seconds to 0.100 seconds, but also limits the maximum number of pulses to a number which a surgeon may select for use in surgical procedures, said electronic controller comprising:

a. modulating means for turning said laser system on and off at a freqency rate of in the range of two hundred cycles per second to twenty cycles per second;
b. a triggering circuit which is electrically coupled to said mechanical triggering circuit and which provides a trigger signal in its triggered state and a reset signal in its untriggered state;
c. a clock circuit which is electrically coupled to said triggering circuit and which provides clock signals in response to said trigger signal;
d. a one-shot monostable, multivibrator circuit having an RC timing circuit which is electrically coupled to said clock circuit and which controls the pulse width of its output

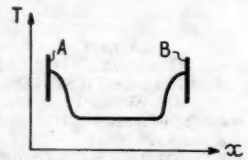


signal in a range of 0.005 seconds and 0.1 seconds in response to said clock signals;
e. a counter which is electrically coupled to said one-shot monostable, multivibrator circuit and which counts each of said clock signals;
f. a comparator which is electrically coupled to said counter in order to compare the number of said counted clock signals to said number which the surgeon has selected and to said clock circuit and which is electrically coupled to said clock circuit, so that, when the number of said counted clock signal equals said number, said comparator provides a clock inhibit signal in order to inhibit said clock circuit from providing any more clock signals.

4,572,190
HYPERTHERMIA APPARATUS

Guy Azam, la Celle-Saint-Cloud; Guy Convert, Vincennes; Jacques Dufour, Orsay; Claude Jasmin, and Joël Sidi, both of Paris, all of France, assignors to CGR/MEV, Buc, France

Filed May 21, 1984, Ser. No. 612,368
Claims priority, application France, May 26, 1983, 83 08727
Int. Cl.[4] A61N *1/40*
U.S. Cl. 128—399 **7 Claims**

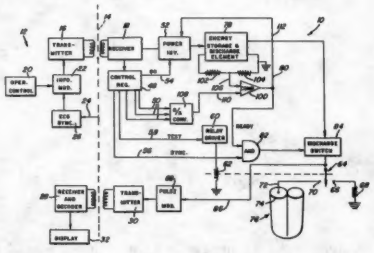


1. A hyperthermia apparatus comprising high-frequency generating means and electrodes designed to be coupled to a patient's body for treatment of abdominal and pelvic regions which constitutes the load, wherein said generating means comprises a high frequency oscillator, a phase-shifting circuit and at least three generators having adjustable phases and amplitudes and wherein the output of each generator is connected to a corresponding electrode, and in which provision is made for three electrodes consisting respectively of a pair of electrodes or buttocks electrodes and of a third electrode or pubic electrode, wherein said phase-shifting circuit comprises means for maintaining the phases of the signals applied to said pair of electrodes substantially symmetrical with respect to a phase origin and means for maintaining the phase of the signal applied to the third electrode substantially in opposition to said phase origin.

4,572,191
COMMAND ATRIAL CARDIOVERTER

Mieczyslaw Mirowski, Rte. 3, Velvet Valley Way, Owings Mills, Md. 21117; Morton M. Mower, Baltimore, Md., and Alois A. Langer, Pittsburgh, Pa., assignors to Mieczyslaw Mirowski, Owings Mills, Md.

Continuation of Ser. No. 349,473, Feb. 17, 1982, abandoned, which is a continuation of Ser. No. 65,228, Aug. 9, 1979, Pat. No. 4,316,472, which is a continuation of Ser. No. 641,381, Dec. 17, 1975, abandoned, which is a continuation of Ser. No. 464,180, Apr. 25, 1974, Pat. No. 3,952,750. This application Feb. 23, 1984, Ser. No. 581,229
Int. Cl.[4] A61N *1/36*
U.S. Cl. 128—419 D **14 Claims**

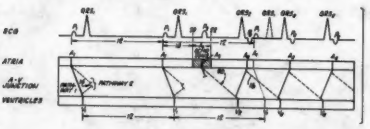


1. A cardioverting device comprising:
detecting means for issuing an electrical signal representing the actual ECG activity of the heart of a wearer of the device;
storage means for storing energy to convert an abnormal cardiac rhythm to normal sinus rhythm;
delivery electrode means for discharging the stored energy into the heart of the wearer;
switch means for controlling the discharge of the stored energy into the heart of the wearer;
charging means for delivering to said storage means said energy to convert the abnormal cardiac rhythm;
first monitoring means for monitoring the operation of said storage means and issuing a first signal when said storage means has stored a predetermined amount of energy;
second monitoring means for monitoring the ECG signal produced by said detecting means and for detecting a preselected repeatable characteristic of the ECG signal, said monitoring means further including means for issuing a second signal each time said second monitoring means detects said preselected repeatable characteristic of the ECG signal;
third monitoring means for monitoring the ECG signal produced by said detecting means for activating said charging means in the presence of abnormal cardiac rhythm in need of correction; and
actuating means connected to said first and second monitoring means and requiring the simultaneous presence of said first and second signals at the time the stored energy is to be delivered to the heart of the wearer, said actuating means for actuating said switching means.

4,572,192
SYSTEM FOR PREVENTION OF PAROXYSMAL SUPRAVENTRICULAR TACHYCARDIA

Warren M. Jackman, Edmond, and Ralph Lazzara, Oklahoma City, both of Okla., assignors to Board of Regents for The University of Oklahoma, Norman, Okla.

Filed Sep. 21, 1983, Ser. No. 534,367
Int. Cl.⁴ A61N *1/36*
U.S. Cl. 128—419 PG **60 Claims**



1. A system for aborting the initiation of a dual pathway tachycardia in a heart producing cardiac impulses induced as a result of an inciting cardiac impulse, comprising the steps of:

determining at least one time range, each time range being an echo zone, following a cardiac impulse within which an inciting cardiac impulse may occur resulting in a dual pathway tachycardia;

determining at least one time range, each time range being an aborting zone, following an inciting cardiac impulse within which an aborting cardiac impulse may be induced in the cardiac muscle for aborting the dual pathway tachycardia which otherwise would have occurred as a result of the inciting cardiac impulse;

sensing cardiac impulses in a heart;

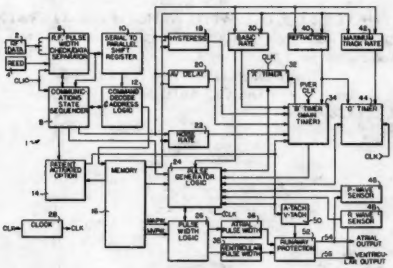
determining a sensed inciting cardiac impulse as a sensed cardiac impulse sensed at a time within the echo zone; and

inducing an aborting cardiac impulse at a time within the aborting zone in response to sensing an inciting cardiac impulse.

4,572,193
DDI PROGRAMMABLE CARDIAC TISSUE STIMULATOR

Brian M. Mann, 12079 Beaufait, Northridge, Calif. 91326, and Jason A. Sholder, 21037 Cantara St., Canoga Park, Calif. 91304

Filed Jan. 27, 1984, Ser. No. 574,715
Int. Cl.⁴ A61N *1/36*
U.S. Cl. 128—419 PG **12 Claims**



1. A programmable apparatus for cardiac stimulation comprising:

a first sensing means for sensing electrical activity in a first area of tissue;

a second sensing means for sensing electrical activity in a second area of tissue;

pulse generating means with means connected to said first and second sensing means responsive to electrical activity sensed from said first and second area of tissue, respectively, for determining timing for supplying stimulation pulses to said first and second areas of tissue for depolarization of said tissue areas;

circuit means within said pulse generation means for inhibiting an apparatus generated stimulation pulse to said first area of tissue when electrical activity is sensed in said first area of tissue caused by a natural depolarization of said first area of tissue without effecting the timing of apparatus generated stimulation pulses to the second area of tissue; and

pulse generating timing means for interacting with said pulse generating means for carrying out timing functions for the pulse generation means

said pulse generating timing means including

a first timing circuit (B) which defines the primary stimulation cycle associated with the supplying of stimulation pulses to said first and second areas of tissue, and

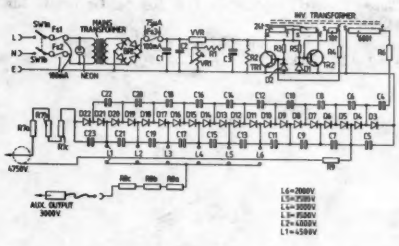
a second timing circuit (A) coupled to the first timing circuit (B) which defines a plurality of states or intervals that are used to verify the electrical activity sensed by said first and second sensing means,

the intervals or states of the second timing circuit (A) not forming part of the primary stimulation cycle defined by the first timing circuit (B).

4,572,194
DEVICE FOR THERAPY OF THE HUMAN OR ANIMAL BODY

Edwin L. Head, Great Swifts, Cranbrook, Kent, England

Filed Oct. 5, 1983, Ser. No. 539,238
Claims priority, application United Kingdom, Oct. 5, 1982, 8228406
Int. Cl.⁴ A61N *1/02*
U.S. Cl. 128—419 R **10 Claims**



1. An electrical therapy apparatus for anatomical applications, comprising; means for producing at an output thereof a high negative voltage between −1000 and −5000 volts, and a direct current of less than 1 mA; and a probe connected to said high negative voltage output, said probe being formed so as to pass electrons from said probe into a contacting or closely juxtaposed part of the anatomy adjacent said probe, wherein said probe comprises an electrode extending from a corona discharge ring.

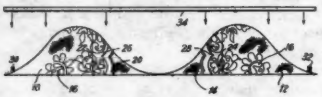
4,572,195
METHOD OF FORMING SEAMLESS FABRIC CUPS AND RESULTING PRODUCTS

Seymour Hyams, Baldwin, N.Y., assignor to Wiener Laces, Inc., New York, N.Y.

Filed Jan. 18, 1984, Ser. No. 571,682
Int. Cl.⁴ B32B *31/20*
U.S. Cl. 128—463 **23 Claims**

1. A method for the molding of a first sheet of material into a three-dimensional product, said method comprising holding an edge of said sheet in position while forming said sheet between male and female mold members, the edge being located between said mold member, said first sheet of material

being permanently molded by said mold members and with the application of heat within a molding range, said member further comprising holding said edge by temporarily connecting the first sheet of material with a second sheet of material which



resists being permanently molded by the application of heat within said range and by holding the edge of the first sheet of material in position by means of said second sheet of material, and separating the sheets from each other after said first sheet is formed.

4,572,196

ARCH SUPPORT ESPECIALLY FOR THE THERAPY OF PES VALGUS IN CHILDREN

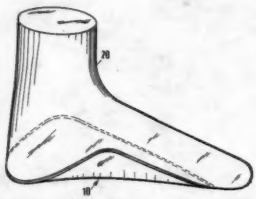
Jan Prahl, Rullfstor, Fed. Rep. of Germany, assignor to IPOS Gesellschaft für integrierte Prothese-Entwicklung und orthopädietechnischen Service mbH & Co. KG, Lüneburg, Fed. Rep. of Germany

Filed Jan. 11, 1984, Ser. No. 569,798

Claims priority, application Fed. Rep. of Germany, Jan. 10, 1984, 8400457[U]

Int. Cl.⁴ A61F *5/14*

U.S. Cl. 128—581 **3 Claims**



1. An orthopaedic arch support, in particular for therapy of pes valgus in children, comprising, in combination, a stocking and a formed body shaped as a foot support, said stocking having a sole part, said formed body is made of a homogenous incompressible elastic silicone caoutchouc adjustable to the dynamic movements of the foot, said formed body is adhered to the surface of the sole part of said stocking, said formed body includes a horizontally extending heel support having a first side and a second side with each of said first and second sides extending in the long direction of the foot, a sustentaculum tali-supporting section extending upwardly from the first side of said heel support, an upwardly extending elastic support edge located along the second side of said heel support spaced laterally from said sustentaculum tali-supporting section, a first correction piece in the form of a supination wedge located below in contact with and secured to said heel support, a second correction piece for supporting the navicular bone extending upwardly from said first correction piece and in contact with the outer surface of said sustentaculum tali-supporting section, and said first and second connection pieces being detachable and replaceable.

4,572,197

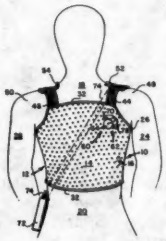
BODY HUGGING INSTRUMENTATION VEST HAVING RADIOACTIVE EMISSION DETECTION FOR EJECTION FRACTION

Richard H. Moore, Concord; H. William Strauss, Newton Centre, and Nathaniel M. Alpert, Swampscott, all of Mass., assignors to The General Hospital Corporation, Boston, Mass.

Continuation-in-part of Ser. No. 394,465, Jul. 1, 1982. This application Jun. 1, 1984, Ser. No. 616,491

Int. Cl.⁴ A61B *5/04*

U.S. Cl. 128—644 **24 Claims**



1. A vest for positioning medical instrumentation about the human or animal torso in a fixed position relative to a torso located organ or tissue for ambulatory torso instrumentation, said vest comprising:

a sheet rigid within the directions of the plane of the sheet, flexible to bending motion and having a shape conforming to a torso thereby forming a vest extending vertically in front from a position just below the neck to a position just above the hips and extending horizontally across the torso from positions just below the armpit and extended rearward of the torso sides terminating at portions on the rearward side of the torso;

means adapted to receive organ interactive instrumentation to be held stably at a location on said vest relative to the organ or tissue within the torso when said vest is worn about the torso; and

means for securing said vest to the torso and for permitting the wearer substantial freedom of movement without affecting the position relative to the organ or tissue of said means adapted to receive said instrumentation.

4,572,198

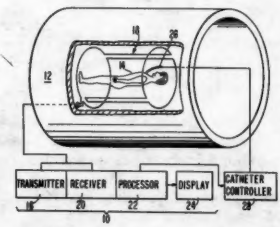
CATHETER FOR USE WITH NMR IMAGING SYSTEMS

Robert S. Codrington, Los Altos Hills, Calif., assignor to Varian Associates, Inc., Palo Alto, Calif.

Filed Jun. 18, 1984, Ser. No. 621,635

Int. Cl.⁴ A61B *5/05*

U.S. Cl. 128—653 **3 Claims**



1. In combination, a magnetic resonance imaging system for obtaining the spatial distribution of a selected magnetic parameter characterizing tissue constituents of a subject and a cathe-

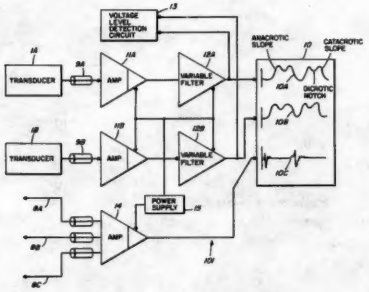
ter for insertion into said subject, said catheter comprising means for controllably disturbing the magnetic field in the vicinity of a local portion of said catheter and thereby interacting with said magnetic resonance imaging system.

4,572,199

SYSTEM TO DETERMINE ARTERIAL OCCLUSION AND OTHER MALADIES

John R. LaCourse, Lee, N.H., assignor to University of New Hampshire, Durham, N.H.

Continuation of Ser. No. 453,605, Dec. 27, 1982, abandoned.
This application Nov. 30, 1984, Ser. No. 677,315
Int. Cl.[4] A61B *10/00*
U.S. Cl. 128—657 32 Claims



1. Apparatus to achieve noninvasive measurement of ocular pulses in mammals, which pulses serve as a basis for determination of any occlusion of extracranial arteries of the mammal, comprising:

a. first piezoelectric transducer means to receive ocular pulses from one eye of the mammal and operable to convert the ocular pulses to a first signal of similar electric pulses,

b. second piezoelectric transducer means to receive ocular pulses from the other eye of the mammal and operable to convert the ocular pulses to a second signal of similar electric pulses,

said transducer means comprising a pair of simultaneously operative piezoelectric benders disposed to bend by substantially horizontal movement, having eye contact means positioned to engage simultaneously the corneas of the two eyes disposed substantially vertically and having support means supporting said piezoelectric benders for movement of said eye contact means substantially horizontally into engagement with said corneas,

c. ECG transducer means to record heartbeats of the mammal in the form of electric signals, and

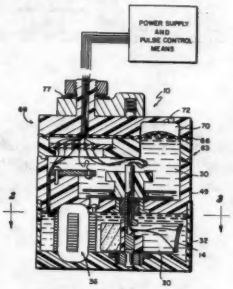
d. display means connected to receive the first signal of similar electric pulses, the second signal of similar electric pulses, and the electric signals, and operable to display the same as a series of waveshapes to permit simultaneous observation and simultaneous comparison of the amplitudes and areas of a waveshape derived from each eye, the amount of distortion of the waveshape derived from each eye, and the delay of the waveshape from each eye with respect to the corresponding ECG signal, to permit an inference of any occlusion of the extracranial arteries of the mammal being checked therefor.

4,572,200

INTRAOPERATIVE SCANNER

Eugene Schroeder, and Francis J. Fry, both of Indianapolis, Ind., assignors to Indianapolis Center for Advanced Research, Indianapolis, Ind.

Filed Apr. 13, 1984, Ser. No. 600,095
Int. Cl.[4] A61B *10/00*
U.S. Cl. 128—660 18 Claims



1. A heat-sterilizable ultrasonic scanner comprising a housing formed to include a fluid-receiving cavity and a vent cavity in communication with both of the fluid-receiving cavity and the atmosphere, an ultrasonic transducer enclosed within the fluid-receiving cavity of the housing, coupling means for coupling ultrasonic energy from the ultrasonic transducer through the housing to a region under examination, a fluid in the fluid-receiving chamber of the housing for coupling ultrasonic energy from the ultrasonic transducer to the coupling means and vice versa, and resilient diaphragm means for permitting expansion and contraction of the coupling fluid in the fluid-receiving cavity of the housing without fluid loss therefrom during use and exposure to sterilization temperatures, said diaphragm means being mounted within the housing in spaced relation to the coupling means location to form a boundary between the fluid-receiving cavity and the vent cavity, the housing further including a wall defining a boundary of the vent cavity and substantially closing the vent cavity, the wall being formed to include an aperture interconnecting the vent cavity and the atmosphere, the wall protecting the resilient diaphragm means during sterilization and use while permitting air contained in the vent cavity to be discharged to the atmosphere via the aperture in response to movement of the resilient diaphragm means during expansion of the coupling fluid in the fluid-receiving cavity.

4,572,201

PROBE FOR INTRALUMINAL ULTRASONIC SCANNER

Shinichi Kondo, Hachioji; Chitose Nakaya, Nishitama, and Shizuo Ishikawa, Tsukui, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 11, 1984, Ser. No. 659,672
Claims priority, application Japan, Oct. 11, 1983, 58-189694
Int. Cl.[4] A61B *10/00*
U.S. Cl. 128—660 4 Claims

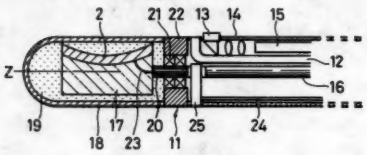
1. A probe for an intraluminal ultrasonic scanner comprising:

an acoustic case of substantially cylindrical shape having a center axis and arranged for insertion in a lumen of a patient, said acoustic case containing a liquid medium;

a rotary shaft disposed along the center axis of said acoustic case and arranged for coupling with a rotating means for rotating said rotary shaft;

an ultrasonic transducer positioned in said acoustic case and coupled to said rotary shaft so that said ultrasonic transducer transmits and receives ultrasonic beams in a direc-

tion substantially perpendicular to said center axis of said acoustic case, said ultrasonic transducer being coupled to said rotary shaft for being mechanically rotated about said center axis of said acoustic case, said acoustic transducer



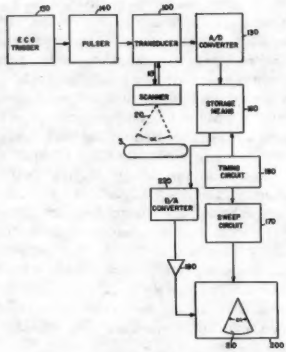
having a transducer surface with a length extending in a direction parallel to the center axis which is longer than the length of the transducer surface thereof extending perpendicular to the center axis.

4,572,202

METHOD AND APPARATUS FOR HIGH-SPEED ULTRASONIC IMAGING

Kai E. Thomenius, Green Lane, Pa., assignor to Elscint Inc., Boston, Mass.

Filed Nov. 14, 1983, Ser. No. 551,711
Int. Cl.[4] A61B *10/00*
U.S. Cl. 128—660 **5 Claims**



1. A method of high-speed ultrasonic imaging using an ultrasonic apparatus including a transducer for directing a beam of ultra-sound pulses toward a body and for converting reflective ultra-sound echo pulses to image-representing electrical signals, a memory array having a plurality of memory segments, and display means for displaying data corresponding to said image-representing electrical signals, comprising the steps of:

(a) periodically scanning said body with said transducer at a rate of approximately 75 frames per second, thereby acquiring sequential frames of image data of a rapidly moving body structure whose display would be blurred were the frames acquired at the conventional rate of 30 frames per second;

(b) storing the frames sequentially in different segments of said memory array; and

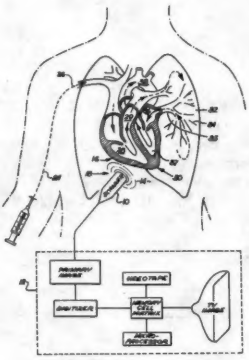
(c) sequentially displaying said stored frames at a rate substantially less than the rate at which the frames were acquired, thereby enabling display of the acquired image data at a rate which can be visualized by a human observer.

4,572,203

CONTACT AGENTS FOR ULTRASONIC IMAGING

Steven B. Feinstein, 295 Hasting Ave., Highland Park, Ill. 60035

Filed Jan. 27, 1983, Ser. No. 461,664
Int. Cl.[4] A61B *10/00*
U.S. Cl. 128—661 **19 Claims**



1. A method of ultrasonic imaging for use in medical procedures, comprising the steps of:

(a) injecting biodegradable, metal-containing microparticles into a mammal to thereby alter the acoustic properties of a predetermined area; and

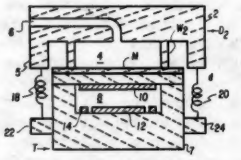
(b) ultrasonically scanning an area including said predetermined area so as to obtain an image of said predetermined area.

4,572,204

PRESSURE DOME WITH COMPLIANT CHAMBER

Thomas P. Stephens, Boxford, Mass., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Mar. 21, 1984, Ser. No. 591,728
Int. Cl.[4] A61B *5/02*
U.S. Cl. 128—675 **6 Claims**



1. A pressure dome for communicating blood pressure to a transducer, comprising

a base,

a wall having a foot being attached to said base so as to form a cavity,

a membrane adhered to the top of said wall so as to close said cavity,

ports communicating with said cavity,

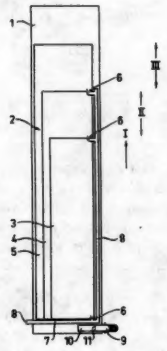
said wall having such low compliance that most of the radial forces caused by the base expanding or contracting are not transmitted to its top.

4,572,205

METHOD AT BLOOD PRESSURE MEASUREMENT AND A BLOOD PRESSURE CUFF FOR CARRYING OUT THE METHOD

Göran Sjönell, 11 Askrikevägen,, S-181 46 Lidingö, Sweden

Filed Sep. 21, 1984, Ser. No. 652,736
Claims priority, application Sweden, Sep. 23, 1983, 8305150
Int. Cl.[4] A61B 5/02
U.S. Cl. 128—686 8 Claims



1. A blood pressure cuff for attachment to a body limb, comprising

(a) a support having bladder means for applying pressure to said body limb, said bladder means including a plurality of chambers each said chamber having unique dimensions;

(b) air pump means for inflating said bladder means;

(c) passageway means for fluidly connecting said air pump means with said bladder means, said passageway means including a main passage and a branch passage for each said chamber, each said branch passage connecting said main passage with a respective said chamber;

(d) clip means associated with said support for selectively occluding said passageway means, said support being adapted to be attached to said limb in surrounding relation thereto with said clip means being engaged with said support to aid in the retention of said support on said limb, said clip means when so engaged occluding said passageway means at a location thereon dependent upon the size of said limb, whereby only any branch passage or passages between said clip means and said air pump means receive air during operation of said air pump means.

4,572,206

METHOD AND APPARATUS FOR MEASURING CARDIAC OUTPUT

Leslie A. Geddes, West Lafayette, Ind., and David S. Grubbs, Philadelphia, Pa., assignors to Purdue Research Foundation, West Lafayette, Ind.

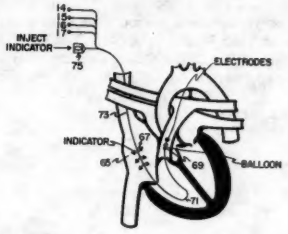
Filed Apr. 21, 1982, Ser. No. 370,568
Int. Cl.[4] A61B 5/02
U.S. Cl. 128—692 26 Claims

1. An indicator-dilution method for measuring cardiac output, said method comprising:

placing a conductivity cell in the flow path of blood;

electrically calibrating said conductivity cell without withdrawing blood from said flow path, said calibrating being accomplished by utilizing said conductivity cell to generate an output indicative of baseline blood resistivity;

injecting an indicator into said blood flow path and obtaining an output signal from said conductivity cell indicative of blood resistivity as altered by said indicator; and



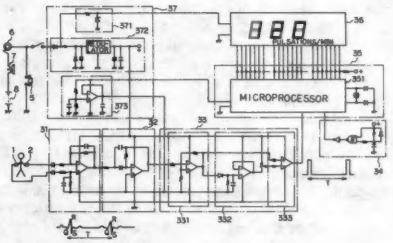
determining cardiac output from said output indicative of baseline blood resistivity and said output signal indicative of altered blood resistivity.

4,572,207

PULSIMETER FOR VEHICLES

Tomohisa Yoshimi, Gamagori, and Yuji Takeo, Toyokawa, both of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Mar. 27, 1984, Ser. No. 593,947
Claims priority, application Japan, May 23, 1983, 58-90509
Int. Cl.[4] A61B 5/04
U.S. Cl. 128—706 9 Claims



1. A pulsimeter for a vehicle having a steering wheel assembly including a slip ring and horn switch comprising:

first and second electrodes, provided on said steering wheel assembly and electrically separated from each other, for picking up electrical potentials when touched by a driver's right and left hands respectively corresponding to muscular activity of a driver's heart;

first circuit means, connected to said electrodes, for differentially amplifying said electrical potentials picked up by said electrodes and providing an output signal corresponding to each heart beat of the driver;

second circuit means, connected to said first circuit means, for calculating the driver's heart pulsation rate by measuring the interval of time between said output signals successively produced by said first circuit means, said second circuit means including microprocessor means for averaging intervals of time from one pulsation to the next successively measured and calculating said pulsation rate therefrom, the microprocessor means including means for discriminating whether each interval is within a predetermined range or not, the averaging means averaging only those intervals within said predetermined range;

display means, connected to said second circuit means and provided on said steering wheel assembly, for displaying said calculated rate; and

voltage supply means, connected to an electric lead connecting said slip ring and horn switch for supplying power to said first and second circuit means and display means.

4,572,208

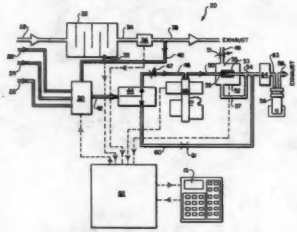
METABOLIC GAS MONITORING APPARATUS AND METHOD

Christopher A. Cutler, Bountiful; William D. Wallace, and Dwayne R. Westenskow, both of Salt Lake City, all of Utah, assignors to Utah Medical Products, Inc., Midvale, Utah

Continuation of Ser. No. 509,209, Jun. 29, 1983, abandoned. This application Jun. 17, 1985, Ser. No. 745,820

Int. Cl.[4] A61B 5/08

U.S. Cl. 128—718 **22 Claims**



1. An apparatus for measuring the metabolic rate of a patient, comprising:

(a) a first inlet conduit for receiving expired gas from the respiratory system of a patient;

(b) a second inlet conduit for receiving gas as inspired by the patient;

(c) a third inlet conduit for receiving a calibration gas;

(d) an outlet conduit;

(e) regulating means, positioned between said inlet conduits and said outlet conduit, for alternately regulating a continuous flow through said outlet conduit of one of said expired gas from the first inlet conduit, inspired gas from the second inlet conduit, or calibration gas from the third inlet conduit, said regulating means thereby serving to alternately allow passage of one gas at a time through said outlet conduit;

(f) a cooler for cooling gas passing therethrough, said cooler being in gaseous communication with said outlet conduit so as to be positioned on the output side of said regulating means and said cooler serving to remove water from or add water vapor to the gas continuously flowing from said regulating means as needed to approximately equalize the water vapor pressure of each gas flowing through said cooler;

(g) first sensing means in communication with the cooler for measuring the amount of carbon dioxide in a gaseous sample;

(h) second sensing means in communication with the cooler for measuring the amount of oxygen in a gaseous sample; and

(i) means for comparing the amounts of carbon dioxide and oxygen in one gaseous sample with those in another gaseous sample.

4,572,209

DYNAMIC BRAKED SPIROMETER

John R. Boehringer, Wynnewood, and C. Harrison Williams, Wyncote, both of Pa., assignors to Boehringer Laboratories, Wynnewood, Pa.

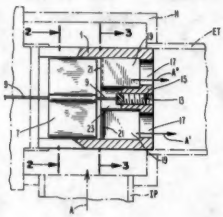
Filed Aug. 27, 1982, Ser. No. 412,226

Int. Cl.[4] A61B 5/08

U.S. Cl. 128—726 **8 Claims**

1. In a spirometer having an inlet port, an outlet port, and rotational means disposed between said inlet and outlet ports and rotationally responsive to flow into said inlet port, the improvement comprising:

means, disposed in said spirometer for substantially instantaneously stopping the rotation of said rotational means in response to the cessation of flow into the inlet port, wherein said stopping means comprises flow impingement braking means for intersecting and stopping rotational flow of air in the spirometer that remains after cessation of flow into the inlet port, wherein said stopping means



comprises at least one vane fixedly mounted within the spirometer, positioned so as not to directly interfere with the flow of air out of the spirometer, with said vane having at least a portion extending at least partially transverse to the direction of flow of air through the spirometer.

4,572,210

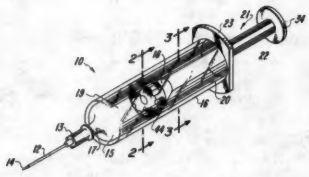
SYRINGE WITH MEANS FOR ALLOWING PASSAGE OF AIR WHILE PREVENTING THE PASSAGE OF BLOOD TO OBTAIN A GAS-FREE BLOOD SAMPLE

Robert J. McKinnon, Franktown, Colo., assignor to Marquest Medical Products, Inc., Englewood, Colo.

Continuation of Ser. No. 279,453, Jul. 1, 1981, abandoned. This application Mar. 18, 1982, Ser. No. 359,292

Int. Cl.[4] A61B 5/00

U.S. Cl. 128—765 **44 Claims**



1. A syringe device for obtaining blood samples comprising in combination:

a tubular body having an interior surface defining an elongated interior chamber, said tubular body having an opening at one end thereof and an end wall at another end thereof, said end wall having an extension protruding therefrom outward of said body, said extension having a bore therethrough, said extension defining means for connecting an hypodermic needle thereto to allow blood to flow from the needle through the bore and into the interior chamber;

plunger means including an elongated plunger rod having a passageway therethrough and a sealing member having a sealing member passageway therethrough in air flow communication with said plunger rod passageway, said plunger rod being operatively connected to said sealing member, said sealing member having a plurality of longitudinal grooves spaced around a circumference thereof, said grooves contacting said interior surface; and

an hydrophobic membrane connected to said plunger means for allowing the flow of air through said plunger rod and sealing member passageways, when said hydrophobic membrane is dry, said hydrophobic filter means further preventing the passage of air and blood through said plunger rod and sealing member passageways upon said

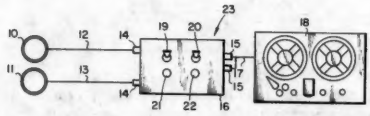
hydrophobic membrane being contaced by said blood at any pressure less than one hundred eighty millimeters Hg.

4,572,211

PENILE TUMESCENCE MONITOR

Ronald L. Sagalowsky, Indianapolis, Ind., assignor to Biorem, Inc., Indianapolis, Ind.

Filed Apr. 26, 1982, Ser. No. 371,611
Int. Cl.⁴ A61B *5/10*; G01D *9/00*; G08B *13/18*
U.S. Cl. 128—774 **8 Claims**



1. A connector device for connecting a penile strain gauge adapted to send penile strain gauge input signals of penile tumescence with a magnetic recording device for the purpose of recording penile tumescence, said device comprising:

a small housing;

strain gauge input jack means mounted to said small housing for connecting with a penile strain gauge;

magnetic recorder output jack means mounted to said small housing for connecting with a magnetic recording device;

electronic conversion means electrically connected with said input jack means and said output jack means and said electronic conversion means for receiving penile strain gauge input signals of penile tumescence at said input jack means and converting said penile strain gauge input signals to electronic magnetically recordable penile tumescence output signals at said output jack means, said conversion means being mounted in said small housing; and

circuit testing means electrically connected with said electronic conversion means, said circuit testing means being operable to test said electronic conversion means to determine whether said electronic conversion means (1) is receiving electrical power, and (2) is converting input signals at said input jack means to output signals at said output jack means, or (3) is receiving penile strain gauge input signals at said input jack means from a penile strain gauge connected to said input jack means.

4,572,212

SUBARACHNOID BOLTS

Fred Letterio, Philadelphia, Pa., assignor to Paul L. Sweeney, Jr., Laurel Springs, N.J.

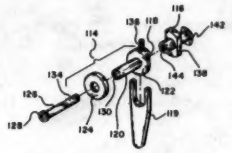
PCT No. PCT/US83/00347, § 371 Date Nov. 3, 1983, § 102(e) Date Nov. 3, 1983, PCT Pub. No. WO83/03190, PCT Pub. Date Sep. 29, 1983
Continuation-in-part of Ser. No. 358,444, Mar. 15, 1982, Pat. No. 4,438,773. This PCT application Mar. 15, 1983, Ser. No. 555,460
The portion of the term of this patent subsequent to Mar. 27, 2001, has been disclaimed.
Int. Cl.⁴ A61B *5/00*
U.S. Cl. 128—748 **7 Claims**

1. A subarachnoid bolt for use in measuring intracranial pressure including:

a lower bolt half having an upper surface and an enlarged flange and a coaxially arranged tubular member extending downwardly from said flange, said tubular member being adapted to be inserted into a substantially complementary shaped hole in a patient's skull with said flange overlying the outer surface of the skull around said hole, at least a part of said tubular member being radially expandable so that the same can be secured to the patient's skull;

means on said lower bolt half allowing the same to be held to prevent rotation thereof;

an upper bolt half including means for screwing the top to said lower bolt half, and means for causing said at least



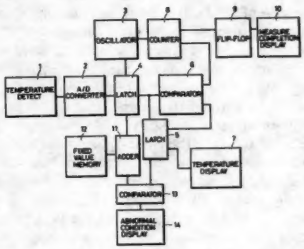
part of said tubular member to radially expand when said two bolt halves are screwed together.

4,572,213

ABNORMAL CONDITION DETECTING SYSTEM IN AN ELECTRONIC THERMOMETER

Masafumi Kawahara, Nara, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jun. 22, 1983, Ser. No. 506,762
Claims priority, application Japan, Jun. 24, 1982, 57-109456
Int. Cl.⁴ A61B *5/00*
U.S. Cl. 128—736 **11 Claims**



1. An electronic thermometer comprising:

temperature detecting means for detecting a body temperature of a person to be measured, said temperature detecting means adapted to be in contact with a selected portion of the body of said person;

means for detecting separation of said electronic thermometer from said selected portion of said body while measuring the body temperature of the person including,

comparing means for comparing the actually detected body temperature derived from said temperature detecting means with a preselected value, and for developing a control signal when said body temperature derived from said temperature detecting means is smaller than said preselected value;

and alarm means for indicating separation of the electronic thermometer from said selected portion of said body in response to said control signal.

4,572,214
ELECTRODE DEVICE

Bjorn E. W. Nordenström, Rönninge, and Mats J. Olsson, Tyresö, both of Sweden, assignors to URSUS Konsult AB, Stockholm, Sweden

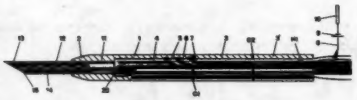
PCT No. PCT/SE81/00112, § 371 Date Dec. 2, 1981, § 102(e) Date Dec. 2, 1981, PCT Pub. No. WO81/02839, PCT Pub. Date Oct. 15, 1981

PCT Filed Apr. 10, 1981, Ser. No. 328,581

Claims priority, application Sweden, Apr. 11, 1980, 8002772

Int. Cl.[4] A61N *1/04*

U.S. Cl. 128—785 **13 Claims**



1. An electrode device arranged to be temporarily introduced into the body of a living being and essentially locally for treating biological body tissue, and to be subsequently removed from the body upon completion of the treatment, comprising:

generally cylindrical hollow electrode means arranged to be introduced into generally solid body tissue to reach a certain treatment point in relation to the body tissue for applying an electric potential at said treatment point, wherein one end of said electrode means has an opening which is adapted to be open toward the treatment point;

a tubular pliable supply unit for providing a supply of electricity from a voltage source to said electrode means, wherein one end portion of said supply unit is coaxially fitted to said electrode means, and another, opposite end portion of said supply unit is arranged to extend outside the body, said supply unit being insulated electrically against other body parts not to be treated;

wherein said supply unit has at least one duct extending over the length thereof to communicate at one end with the outside of the body, and to communicate at the other end with the opening in said one end of said electrode means which opening is adapted to be open toward the treatment point in the body tissue, said duct providing a fluid passage in said supply unit which is in open fluid communication between said treatment point in the body tissue and a position outside the body, and which passage is closed in relation to said other body parts not to be treated;

at least one electrical conductor contained in said duct in said supply unit and electrically connected to said electrode means for excitation of said electrode means wherein said electrical conductor is insulated electrically from said other body parts by a wall of said supply unit;

means operatively associated with said electrode means for introducing said electrode means into the body tissue, and

means for anchoring said electrode means at said treatment point.

4,572,215
SPLITTER BLADE FOR THRESHING ROTOR

Daniel Pakosh, Winnipeg, Canada, assignor to Versatile Corporation, British Columbia, Canada

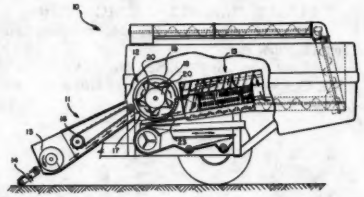
Filed Nov. 30, 1982, Ser. No. 445,668

Claims priority, application Canada, Dec. 3, 1981, 391425

Int. Cl.[4] A01F *12/18*

U.S. Cl. 130—27 R **6 Claims**

1. A threshing assembly for a combine harvester, said assembly comprising a substantially cylindrical housing, a substantially cylindrical rotor rotatable within said housing, a crop feed area located centrally of said threshing assembly to receive crop, guide means on the upper inside periphery of said housing to guide said crop to respective opposite sides of said threshing assembly, threshing means on said rotor operable to thresh said crop, said threshing means comprising a plurality of rasp bars running continuously for substantially the length of said rotor and parallel to the axis of said rotor, said rasp bars



being spaced substantially equidistant and intermittently about the periphery of said rotor, and cutting means centrally located on said rotor adjacent said rasp bars and operable to sever said crop at said crop feed area.

4,572,216
APPARATUS FOR FILLING CIGARETTE PAPERS WITH TOBACCO

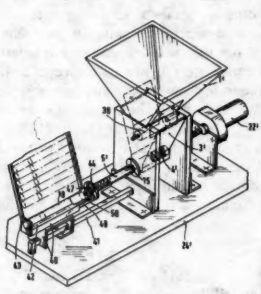
Horst Josuttis; Ralf Meierkord, both of Espelkamp, and Hans-Jürgen Welsch, Mannheim, all of Fed. Rep. of Germany, assignors to Harting Elektronik GmbH, Espelkamp, Fed. Rep. of Germany

Filed Dec. 22, 1983, Ser. No. 564,625

Claims priority, application Fed. Rep. of Germany, Dec. 22, 1982, 3247370

Int. Cl.[4] A24F *5/42*

U.S. Cl. 131—70 **15 Claims**



1. Apparatus for manufacturing cigarettes, comprising a tobacco hopper having a lower aperture, dispensing means receiving tobacco from said aperture and dispersing said tobacco, said dispensing means comprising a rotatable knife shaft disposed in said aperture of said hopper, a tobacco supply chamber disposed below said hopper to receive tobacco from said dispensing means, conveyor means in said tobacco supply chamber for forming tobacco into a strand, an outlet on said tobacco supply chamber for the lateral discharge of the said strand of tobacco, and a cigarette paper shell filling tube disposed adjacent to said outlet to receive therefrom said strand of tobacco to thereby form a cigarette.

4,572,217
FIRE-SAFE CIGARETTE HOLDER SYSTEM

William E. Newman, Sr., 207 Doncaster Rd., Joppa, Md. 21085, and Paul D. Newman, 7 Nacelle Rd., Baltimore, Md. 21220

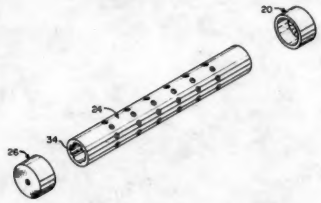
Filed Oct. 26, 1983, Ser. No. 545,697

Int. Cl.[4] A24F *13/08, 13/14, 13/16, 13/18*

U.S. Cl. 131—175 **1 Claim**

1. A system providing for fire-safe guarding of burning ends

of cigarettes comprising: a tubular middle portion, a first end cap on the tubular middle portion, means on the first end cap for receiving a said cigarette therethrough and holding said cigarette with burning end in said tubular middle portion, means in said tubular middle portion for coacting to promote burning of said cigarette for limited intervals, a second end cap



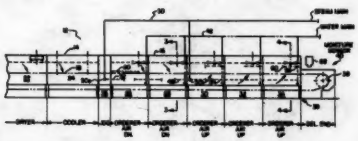
with a hole therethrough, on said tubular middle portion, said means for coacting to promote burning of a cigarette for limited intervals comprising the tubular middle portion having a plurality of perforations and a plurality of inward protrusions for engaging a cigarette, said means for receiving a said cigarette comprising an aperture-defining membrane with a plurality of slits radially outward therefrom.

4,572,218

REMOISTENING OF TOBACCO

Edwin W. Hine, Philadelphia, and Jack B. Rosenbloom, Elkins Park, both of Pa., assignors to Proctor & Schwartz, Inc., Horsham, Pa.

Filed Oct. 27, 1983, Ser. No. 545,920
Int. Cl.⁴ A24B *3/12*
U.S. Cl. 131—302 **11 Claims**



6. A tobacco reordering apparatus comprising
(a) a chamber having an inlet and exit end;
(b) foraminous conveyor means extending longitudinally within said chamber between said inlet and exit ends, adapted to move a bed of tobacco through the chamber;
(c) circulation means adapted to circulate a treating medium through said conveyor means;
(d) water spray means adapted to introduce into said treating medium a fine spray of water droplets;
(e) steam spray means adapted to introduce into said treating medium a flow of steam;
(f) moisture measuring means contiguous with said chamber exhaust end adapted to measure the moisture level of said bed of tobacco and to produce a moisture signal;
(g) temperature measuring means in said chamber adapted to measure the temperature of said bed of tobacco in said chamber and to produce a temperature signal;
(h) water control means responsive to said moisture signal adapted to control the rate of water flow; and
(i) steam control means responsive to said temperature signal means adapted to control the rate of steam flow.

4,572,219

PROCESS FOR IMPROVING TOBACCO

Helmut Gaisch, Cormondreche, and Urs Nyffeler, Corcelles, both of Switzerland, assignors to Fabriques de Tabac Reunies S.A., Neuchatel, Switzerland

Filed Jan. 19, 1979, Ser. No. 4,626
Int. Cl.⁴ A24B *3/14, 15/02*
U.S. Cl. 131—308 **10 Claims**

1. A microbial process for reducing the content of nitrates or nitrites contained in tobacco material under controlled aerobic conditions comprising the steps of
a. extracting tobacco material with water to obtain an aqueous tobacco extract and a tobacco residue,
b. inoculating the tobacco extract obtained in Step (a) with a concentrated culture of microorganisms selected from the genus Enterobacter, said microorgansisms being in their exponential growth phase,
c. incubating the inoculated tobacco extract with aeration at a rate up to about 3000 ml/min at a pH of about 6.6 to about 7.5 and a temperature between about 25° to 35° C. for a period of time sufficient to reduce the nitrates or nitrates contained therein to a lower level,
d. terminating the activity of the microorganisms and
e. thereafter concentrating and reapplying the extract to the tobacco residue and drying the resulting product to a moisture content of about 10 to 30%.

9. A microbial process for reducing the nitrate and nitrites contained in a homogenized slurry of tobacco materials comprising the steps of
a. inoculating the homogenized slurry with a concentrated culture of microorganisms selected from the genus Enterobacter, said microorganisms being in their exponential growth phase,
b. incubating the inoculated slurry under sterile conditions at a pH of about 6.6 to 7.5 and a temperature between about 25° to 35° C. with aeration of about 150 to 3000 ml/min for a period of time sufficient to effect a reduction in the nitrate or nitrite content of the slurry, and
c. casting the resulting denitrated slurry into or onto sheets and thereafter drying the sheets to a moisture content of about 10 to about 30% to produce reconstituted tobacco.

4,572,220

COMPOSITION FOR ALTERING THE CONFIGURATION OF HAIR

Du Y. Hsiung, Park Forest; Chester A. Davis, Berwyn, and Harold J. Nicholson, Roselle, all of Ill., assignors to Helene Curtis Industries, Inc., Chicago, Ill.

Continuation of Ser. No. 236,127, Feb. 19, 1981, Pat. No. 4,391,286. This application Jun. 30, 1983, Ser. No. 509,641
Int. Cl.⁴ A45D *7/00*
U.S. Cl. 132—7 **3 Claims**

1. A composition for altering the configuration of hair comprising (a) water, (b) a water-soluble quarternary nitrogen-containing hydroxyethyl cellulose derivative having a molecular weight between about 10,000 and 10,000,000, (c) a water-solubla disulfide-containing polycarboxylic acid or salt thereof, and (d) a thiol-containing waving agent.

4,572,221

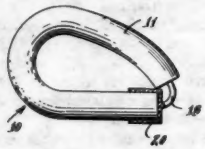
SOFT ROLLER HAIR CURLER AND HEATING ARRANGEMENT THEREFOR

George Barradas, 15 Riverview Ct., Glenville, Conn. 06830

Filed Jun. 11, 1984, Ser. No. 619,639
Int. Cl.⁴ A45D *2/12*
U.S. Cl. 132—33 R **7 Claims**

1. An elongated roller hair curler for wrapping hair about the exterior surface thereof comprising an outer sleeve of soft yieldable material, a heatable flexible spring element within said sleeve and adapted to be heated by induction, and means

on one end of said sleeve for removably attaching said end to the other end of said roller when said roller is bent to a position



whereby the other end is located adjacent to said securing means.

4,572,222

USE OF FLEXIBLE ABRASIVE PAD FOR WET ETCHING OF FINGERNAILS

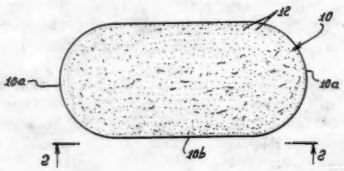
William E. Pangburn, Ventura, Calif., assignor to William W. Haefliger, Pasadena, Calif., a part interest

Continuation-in-part of Ser. No. 356,830, Mar. 10, 1982, Pat. No. 4,459,987. This application Aug. 13, 1982, Ser. No. 407,738

The portion of the term of this patent subsequent to Jul. 17, 2001, has been disclaimed.

Int. Cl.[4] A45D *29/20*

U.S. Cl. 132—76.4 **4 Claims**



1. A flexible cosmetic abrasive sheet suitable for wet etching a natural or artificial fingernail, by rubbing contact therewith, that comprises

(a) a tough, flexible, thin, foldable and stretchable pad of silicone polymer, and

(b) abrasive pumice or pumice like particulate at least partially embedded in and below the outer surface of the silicone polymer pad to be directly carried thereby, and the particulate protruding from at least one side of the pad and exposed for rubbing contact with said fingernail, the particulate embedded in the polymer being cure-bonded thereto as a result of final curing of the polymer.

4,572,223

DENTAL BRUSH HOLDER AND ASSEMBLY

Marvin L. Rosenfeld, Manhattan Beach, Calif., assignor to Dentool, Inc., Manhattan Beach, Calif.

Filed Sep. 12, 1983, Ser. No. 530,869

Int. Cl.[4] A45D *44/18*

U.S. Cl. 132—84 R **16 Claims**

1. A dental brush holder, comprising an elongate, plastic holder, including:

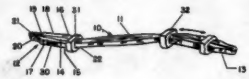
a. a central member;

b. end portions integrally formed at each end of the central member, and inclined thereto;

c. outwardly formed sidewalls provided by at least one end portion and defining respective slits, each slit comprising interior and exterior ends, stress relieving slots being defined at each of said interior and exterior ends, the said sidewalls of the slot being outwardly inclined at the exterior and interior ends, and being parallel medially of the ends;

d. a brush retaining slot defined within each slit; and,

e. compression rings adapted to slide along their respective end portions and compress the sidewalls; whereby, i. when a dental cleaning brush is inserted into said brush retaining slot, it will be initially secured by frictional



contact within the slot; ii. movement of the compression ring compresses the parallel sidewalls and the slit to further secure the brush within the slot; and, iii. retraction of the compression ring permits the sidewalls to expand, and enable removal of the brush.

4,572,224

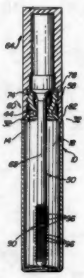
UNITARY TUBULAR STORAGE RECEPTACLE WITH RESTRICTED FLUID DISPENSING CONTROL PASSAGE

Karen W. Rosenwinkel, Oak Park, Ill., and Jerry R. Jinks, Kendall Park, N.J., assignors to W. Braun Company, Chicago, Ill.

Filed Oct. 24, 1984, Ser. No. 664,161

Int. Cl.[4] A45D *40/00*

U.S. Cl. 132—88.5 **10 Claims**



1. A receptacle for the storage of fluid and fluid-like preparations to be dispensed therefrom by means of a rod-like dispensing and applicator wand adapted to be protectively and sealingly retained within said receptacle during periods of non-use,

said receptacle being of a unitary configuration defining integrally-formed, lineally-arrayed, coaxial components including a base consisting of an elongated, open top reservoir of a lineal depth to receive and to house therewithin substantially the full length of a wand for dispensing materials stored in said reservoir,

a neck portion of said receptacle and means supporting said neck portion to surrmount said reservoir,

said neck portion defining a substantially reduced access opening into said reservoir,

said means supporting said neck portion comprising flange means surmounting and integrally formed with said reservoir and said neck portion of said receptacle and inter-

posed therebetween for coupling said neck portion of said receptacle to said reservoir,

said flange means including an annular shoulder portion extending generally normally of a principal bounding vertical, upstanding wall of said receptacle for providing a seal for sealing engagement with an abutting, downwardly-presented lower end face of closure means for capping said receptacle,

said neck portion having an outer diameter of an expanse significantly reduced as compared with a transverse dimension of said reservoir,

a generally cylindrical, open-ended mouth and throat assembly constituting a tubular section integrally formed with and surmounting said neck portion and defining an entry port for access into said reservoir,

said tubular section having an internal diameter greater than that of said neck portion and an outer diameter less than that of a transverse dimension of said reservoir,

said tubular section being integrally formed on an outer annular circumscribing wall thereof with thread means for coupling engagement with cooperating thread means carried by the closure means for said receptacle.

4,572,225
APPARATUS FOR COUNTING COINS OR SIMILAR DISCS

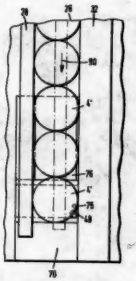
Bernd Petri, Oftersheim, and Jürgen Riffel, Bruchsal, both of Fed. Rep. of Germany, assignors to Standardwerk Eugen Reis GmbH, Bruchsal, Fed. Rep. of Germany

Filed Dec. 28, 1979, Ser. No. 108,042

Claims priority, application Fed. Rep. of Germany, Nov. 10, 1978, 2848760

Int. Cl.⁴ G07D *9/04*

U.S. Cl. 133—8 E **7 Claims**



1. Apparatus for counting coins or the like of the same diameter, comprising a flat track with marginal edges on which said coins may be arranged in single file without lateral movement, means for feeding a substantially endless stream of coins to one end of said track, means for propelling said coins along said track in successive abutting relationship and providing a space between successive coins along the marginal edges of the track, a counting station located downstream of the feeding means along one marginal edge of said track and in alignment with the spaces between successive coins, said counting station being provided with means for sensing individual coins passing said counting station and stop means in close proximity to said sensing means, both the sensing means and the stop means being in alignment with the lateral spaces between successive coins, and in such close proximity as to be able to be simultaneously traversed by a single one of said coins, actuating means operative to move said stop means in response to a signal and control means responsive to the sensing of the last of a predetermined number of individual coins for producing a signal causing said actuating means to move said stop means initially into engagement with a face of said last of the predetermined number of coins simultaneously with its passing the counting station and thereafter on passage of said last of the predetermined coins to penetrate into the interspace between the last of the predetermined coins and the next successive coin on said track to block the movement of coins therealong.

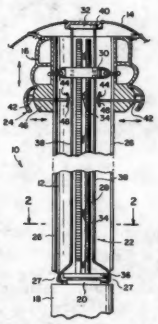
4,572,226
PUSH BUTTON AUTOMATIC OPEN AND CLOSE UMBRELLA

Gery R. Williams, and George Spector, both of 233 Broadway, Rm. 3615, New York, N.Y. 10007

Filed Aug. 9, 1984, Ser. No. 639,225

Int. Cl.⁴ A45B *25/16*

U.S. Cl. 135—22 **5 Claims**



1. In a push button automatic open and close umbrella of the type having a hollow tubular post, an umbrella top, a runner slideably engaging said post for movement of said top into open and closed positions with respect to said post and a handle at bottom of said post the improvement which comprises:

(a) a miniature forward and reverse drive motor mounted in said handle;

(b) a drive mechanism within said post activated by said motor to operate said runner; and

(c) a manual override device to disengage said drive mechanism to manually operate said runner, wherein said post has two longitudinal opposite slots therein and said drive mechanism comprises:

(a) a longitudinal split threaded shaft that is spring biased, said shaft mounted stationary to said handle;

(b) a drum having internal threads engageable to said shaft, said drum interconnected to said runner through said slots in said post; and

(c) a bearing having a plurality of thin rods, said bearing mounted to center of said umbrella top while said rods extend through said drum to said motor so that motor rotation will rotate said rods which will cause drum rotation and axial movement of said drum on said shaft to operate said runner.

4,572,227
HANDGRIP FOR A CRUTCH

William K. Wheeler, Amherst, N.H., assignor to W. K. Wheeler, Inc., Amherst, N.H.

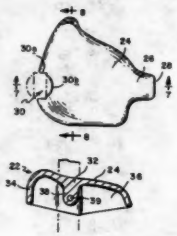
Filed Oct. 1, 1984, Ser. No. 656,765

Int. Cl.⁴ A61H *3/02*

U.S. Cl. 135—72 **3 Claims**

1. A handgrip for a crutch embodying spaced, parallel, generally vertical anterior and posterior supports, comprising a rigid hand support defining a hand supporting surface contoured to accommodate substantially the entire planar surface of the hand, said hand support having inner and outer sides and posterior and anterior ends, and peripherally thereof an integral depending stiffening flange of a depth corresponding

substantially to the length of the second phalanx of the fingers such that the first phalanx can be curled about the lower edge of the flange to enable grasping the hand support and substantially medially of the inner and outer sides, an integral dependent reinforcing rib extending from the posterior side to the anterior side containing a through hole for receiving an attaching bolt for attaching the handgrip to the anterior and posterior supports of the crutch, said flange at the anterior side defining a substantially vertical planar surface and said flange at the posterior side containing a recess defined by spaced, parallel, vertically-disposed flat surfaces corresponding in depth to the



depth of the flange and inwardly thereof an arcuate surface subtending the inner ends of the vertical surfaces of a depth corresponding to the depth of the flange, said planar surface and recess being located at the anterior and posterior ends of the stiffening rib such that the attaching bolt passes through the planar surface and through the recess, said planar surface and recess enabling the support to be applied to a crutch having supports of circular or rectangular cross section and providing for fixing the hand support in a horizontal position with the hand supporting surface uppermost for use and in a vertical position for storage.

4,572,228

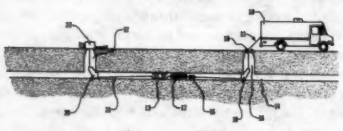
CONNECTOR VALVE ASSEMBLY FOR INFLATABLE PACKER DEVICE

Richard E. Larson, Minnetonka; Dale K. Nelson, Minneapolis, and Allen D. Mathison, Richfield, all of Minn., assignors to Cherne Industries, Inc., Minneapolis, Minn.

Filed Dec. 24, 1984, Ser. No. 685,540

Int. Cl.[4] G01M *3/08;* **F16K** *43/00;* **F16L** *55/16, 55/18*

U.S. Cl. 137—15 **20 Claims**



18. A method for interiorly testing the walls of a pipe with an inflatable packer device having a two component grouting system and a three hose input system for transferring the two grouting components and a test media fluid, said method comprising:

(a) providing an inflatable packer device in a pipeline section to be tested, said packer device having two chemical component input lines and being communicatable to external feeding lines having a test media line and two chemical component input lines,

(b) inserting a connector valve assembly between said inflatable packer device and said external input lines, said connector valve assembly comprising:

(1) a first chemical conduit having an actuable valve means and connector means at opposite ends for the controlled flow of a first chemical component,

(2) a second chemical conduit having actuatable valve means and connector means at opposite ends for the controlled flow of a second chemical component,

(3) valve actuating means to simultaneously actuate the valve means in said first and second chemical conduits, said valve actuating means being actuated by the controlled flow communication within said second chemical conduit at a location before its actuatable valve, and

(4) a test media conduit having a check valve therein and a connector means at one end for the transfer of a testing fluid, said test media conduit being in communication at its opposite end to said second chemical conduit at a location after its actuatable valve,

(c) expanding said packer device within the pipeline portion to be tested,

(d) activating said test media line through said second chemical component input line, and

(e) measuring the back pressure exerted on said inflated packer to determine leakage in the pipeline portion.

4,572,229

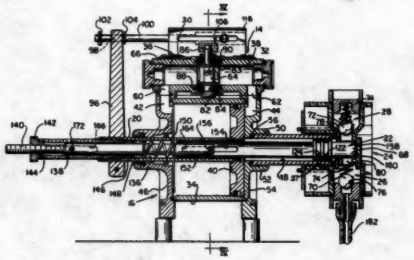
VARIABLE PROPORTIONER

Thomas D. Mueller, 666 Woodlane, Lake Forest, Ill. 60045, and James D. Gessner, Chicago, both of Ill., assignors to Thomas D. Mueller and Crown Technology Corporation, both of Lake Forest, Ill.

Filed Feb. 2, 1984, Ser. No. 576,413

Int. Cl.[4] F04B *35/00*

U.S. Cl. 137—99 **11 Claims**



1. In a portable self-powered fluid proportioning device which comprises in combination:

a fluid supply conduit means,

a movable motor piston means,

a fluid gating means disposed intermediate said fluid supply and said piston means to cause reciprocating movement of said motor piston means,

a connecting rod means secured to said piston means for movement therewith, and

a slave pump piston connected to said connecting rod for providing responsive reciprocatory movement of said slave pump piston within a pump cylinder,

the improvement comprising:

a spring biased lost motion connection, wherein said lost motion connection comprises a slot and pin arrangement, between said connecting rod and said slave pump piston in which said slave pump piston is continuously biased toward an end wall of said pump cylinder and is selectively movable away from said end wall by action of an adjustable connection between said connecting rod and said slave pump piston which permits an adjustable amount of movement of said connecting rod prior to effecting movement of said slave pump piston.

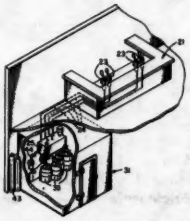
4,572,230
BEVERAGE TUBE CLEANER

Paul J. Mirabile, 100 Sparango La., Plymouth Meeting, Pa. 19462

Continuation-in-part of Ser. No. 506,859, Jun. 22, 1983, Pat. No. 4,527,585. This application Oct. 2, 1984, Ser. No. 656,970

Int. Cl.[4] B08B *3/04, 9/06*

U.S. Cl. 137—240 **17 Claims**



1. An apparatus for cleaning a beverage delivery system of a type having at least two conduits, each of the conduits carrying a beverage from a source container to an output, each of the conduits having a releasable standardized fitting having an operable fluid flow line, each standardized fitting being adapted to engage its respective source container, and an openable spigot at the output of each conduit, the apparatus comprising:

a supply for cleaning solution, a supply for pressurized water, and a drain;

valve means defining an input for alternatively and temporarily connecting the supply of cleaning solution and the supply of pressurized water, respectively, to a first of said conduits;

means definning an output for temporarily connecting a second of said conduits to the drain;

a casing means for housing the cleaning apparatus

at least one union being a surface of the casing and operable to receive the standardized fittings for both said conduits by disconnecting said standardized fittings from the source containers and connecting said standardized fittings to said at least one union to cause said standardized fittings to open to liquid flow so that said conduits can be cleaned; and,

a controller operable upon initiation to sequentially operate the input and the output to drain, clean and rinse the beverage delivery system.

4,572,231
ROTARY PLUG VALVE

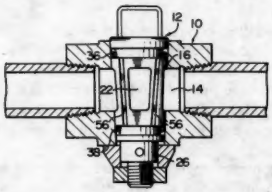
Yoshio Katayama, Kuwana, Japan, assignor to Hitachi Metals, Ltd., Japan

Filed Aug. 7, 1984, Ser. No. 638,568

Claims priority, application Japan, Aug. 8, 1983, 58-143894

Int. Cl.[3] F16K *5/22*

U.S. Cl. 137—246.15 **5 Claims**



1. In a rotary plug valve including: a valve body member having a through bore constituting a fluid passage and a vertical through bore which crosses the fluid passage at a right angle, said vertical bore being formed with a plug seat surface in which the ports of said fluid passage open; a plug member adapted to be received by said vertical bore of said valve body member and having a fluid passage including ports capable of being aligned with the ports in said plug seat, the peripheral surface of said plug member opposing said plug seat being formed with at least its central portion including said ports having a seat surface which can make a sealing contact with said plug seat; circumferential grooves formed in either one of the seat surfaces of said valve body member and said plug member at both longitudinal end portions so as to sandwich the central region of said one of said valve body member and said plug member, each of said circumferential grooves having a bottom wall and opposing end walls; elastically deformable packing "O" rings received in said circumferential grooves so as to be pressed between the bottom walls of said circumferential grooves and the seat surface of the other of said valve body member and said plug member thereby to form tight seals therebetween; a plurality of channels formed in the seat surface of either one of said valve body member and said plug member so as to extend longitudinally at both sides of each port of said either one of said valve body member and said plug member in such a manner as to provide communication between said circumferential grooves thereby forming a closed lubrication system; and means including a passage connected to at least one of said channels and adapted for allowing a lubricant to be charged therethrough into said closed lubrication system; wherein the improvement comprises that said bottom wall of each of said circumferential grooves is inclined toward said central region relative to said opposing seat surface so that the distance between said bottom wall and the opposing seat surface is greater at the end of said circumferential groove proximate said central region than at the end of said circumferential groove distant said central region, whereby during charging of the valve with lubricant, the "O" rings are caused to deform elastically by being wedged into the portions of the respective grooves distant said central region thereby providing a more effective seal and storing pressure energy therein.

4,572,232
CONCEALED SANITARY VALVE UNIT

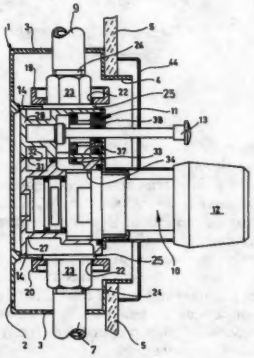
Walter F. Gruber, Widmaierstr. 165 B, D-7000 Stuttgart 80, Fed. Rep. of Germany

Filed Jul. 31, 1984, Ser. No. 636,311

Claims priority, application Fed. Rep. of Germany, Aug. 2, 1984, 3327829

Int. Cl.[4] F16L *5/00;* **E03C** *1/00*

U.S. Cl. 137—360 **14 Claims**



1. A concealed valve unit comprising in combination

(a) a housing adapted to be inserted into a wall opening for flush mounting therein, said housing having openings

therein that are sized to accomodate two water supply lines and two output water lines,

(b) a valve body arranged within said housing, said valve body including control elements and passageways that are adapted to control the flow of water through the valve body,

(c) operating members operatively associated with said valve body and extending through a mounting window located in said housing,

(d) said valve body having two spaced apart outer connecting faces, said connecting faces containing openings that communicate with said passageways in said valve body that are adapted to control the flow of water through said valve body,

(e) connecting nuts that are adapted to be threaded onto the ends of said water supply lines and onto the ends of said output water lines, each of said connecting nuts having a planar end face that is adapted to sealingly engage with the portions of said connecting faces of the valve body that contain openings,

(f) spaced apart clamping means mounted within said housing for engaging said end connecting nuts so that when said clamping menas are brought together they will clamp the planar end faces of said connecting nuts in sealing engagement with said openings in the connecting faces of the valve body, thereby establishing controlled communication from said water supply lines, through said valve body and out through said output water lines.

4,572,233

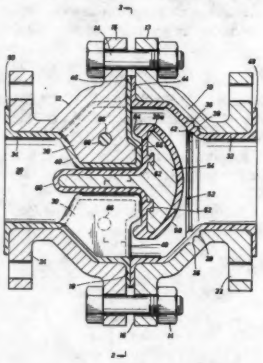
LINED CHECK VALVE

Frank G. Weeden, P.O. Box 55156, Houston, Tex. 77255

Filed Mar. 30, 1983, Ser. No. 480,268

Int. Cl.[4] F16K *15/04*

U.S. Cl. 137—375 **23 Claims**



1. A check valve comprising:

a valve body having a longitudinal flowway therethrough;

a plurality of guide formations extending radially inwardly from said valve body into said flowway, said guide formations being discontinuous from one another at their radially inner ends;

liner means on the interior of said valve body following the contour of said guide formations so that the portions of said liner means which cover respective guide formations are discontinuous at their radially inner ends, said liner means having thermal properties differing from those of said guide formations;

said valve body having a valve seat longitudinally spaced from said guide formations;

and a valve element longitudinally reciprocable in said flowway and including a closure portion opposing said valve seat and engageable and disengageable with said valve seat by means of such longitudinal reciprocation, and an elongate valve stem extending longitudinally from said closure portion and surrounded by and slidably engaged with the lined inner ends of said guide formations for guidance in such reciprocation.

4,572,234

HYDRAULIC FLOW CONTROL VALVE

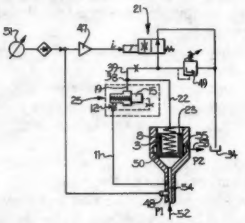
Hans Schwelm, Kaarst, Fed. Rep. of Germany, assignor to Barmag Barmer Maschinenfabrik AG, Remscheid, Fed. Rep. of Germany

Division of Ser. No. 279,780, Jul. 2, 1981, Pat. No. 4,476,893. This application Aug. 23, 1984, Ser. No. 643,546

Claims priority, application Fed. Rep. of Germany, Jul. 4, 1980, 3025315; Dec. 16, 1980, 3047244

Int. Cl.[4] F16K *31/122*

U.S. Cl. 137—489 **9 Claims**



1. A hydraulic flow control valve comprising

a housing have a bore therein,

a hydraulic inlet channel and a hydraulic outlet channel, each communicating with said bore in said housing,

valve means mounted in said bore for movement between a closed position closing communication between said inlet and outlet channels, and an open position permitting such communication,

adjustable control means for biasing said valve means toward its closed position, and including

(a) constant volume flow restriction means for providing a constant volume hydraulic flow,

(b) a first line connected downstream of said constant volume flow restriction means,

(c) adjustable transducer means operatively connected to said first line for maintaining a pressure in said first line which varies in accordance with the value of a variable input signal,

(d) a second line connected downstream of said constant volume flow restriction means and parallel to said first line, said second line leading to said bore in said housing and so that the pressure in said second line is adapted to bias said valve means toward its closed position,

(e) pressure sensor means positioned in said inlet channel, and

(f) feedback means operatively interconnecting said pressure sensor means and said transducer means, whereby the output of said pressure sensor means acts as a variable input signal to said transducer means to control the pressure in said second line and thus the positioning of said valve means.

4,572,235
MIXING APPARATUS

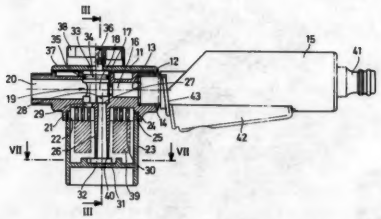
Johann Katzer, Neu-Ulm; Franz Lopic, Nersingen; Roland Sauer, Ulm-Gögglingen, and Christian Stephany, Ulm-Wiblingen, all of Fed. Rep. of Germany, assignors to Gardena Kress & Kastner GmbH, Fed. Rep. of Germany

Filed Aug. 10, 1983, Ser. No. 521,927

Claims priority, application Fed. Rep. of Germany, Aug. 19, 1982, 3230783

Int. Cl.⁴ F17D *1/00*

U.S. Cl. 137—268 **11 Claims**



1. A device for uniformly dissolving a solid additive in flowing liquids, comprising:

a container forming an open-topped receptacle;

a rigid additive body having a hollow core, the additive being disposed in the receptacle, an external surface of the additive and an internal surface of the additive to be dissolved away by the flowing liquids;

means for sealably closing the receptacle;

means defining a liquid inlet to the receptacle and a liquid outlet from the receptacle; and,

a tube providing fluid communication from the liquid inlet to an outlet of the tube near a bottom of the receptacle, outer dimensions of the additive being smaller than inner dimensions of the receptacle and inner dimensions of the additive being larger than outer dimensions of the tube, the receptacle, tube and additive defining inner and outer annular spaces, the additive being positioned in the receptacle such that liquid flows unidirectionally in concentric axial paths toward the liquid outlet, through flowpaths defined by the annular spaces, one path being defined by the annular space between the tube and the inner surface of the additive and another path being defined by the annular space between the outer surface of the additive and the receptacle, whereby dissolution of the additive from the inner and outer surfaces remains constant as the inner surface is enlarged and the outer surface is diminished while the additive dissolves.

4,572,236
VALVE STABILIZING CRADLE

Richard Baker, 10304 Cherrywood Dr., Richmond, Va. 23233

Filed May 6, 1985, Ser. No. 731,044

Int. Cl.⁴ F16L *5/00*

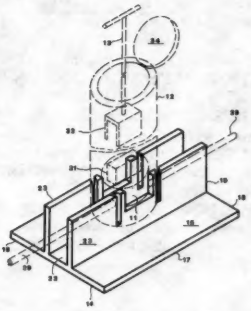
U.S. Cl. 137—364 **4 Claims**

1. A cradle device for a curb cock comprised of a housing having an outwardly protruding uppermost circular shoulder and a valve stem provided with an uppermost engagement head, said cradle device being of integral monolithic construction and comprising:

(a) a base portion adapted to be horizontally disposed, having an upper surface, flat lower surface, and centered circular aperture,

(b) an elongated upwardly opening trough defined by paired parallel walls rising upwardly from the upper surface of said base portion and positioned such that said circular aperture is centered on the midpoint of the longitudinal axis of said trough, the width of said trough, measured between facing surfaces of said walls, being such as to closely accommodate a curb cock and pipes associated therewith,

(c) four narrow slots vertically disposed in said walls in paired relationship in a circular locus centered upon said circular aperture, said slots being adapted to seat the



lowermost extremity of a curb box of circular contour, and

(d) two identical wide slots positioned in said walls in opposition about the midpoint of said trough and adapted to accommodate the outwardly protruding shoulder of said housing.

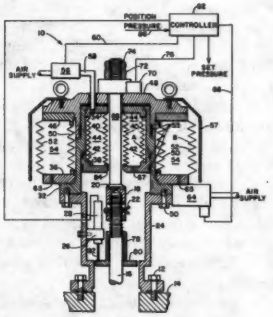
4,572,237
FUNCTION ASSIST CONTROL FOR PRESSURE RELIEF VALVE

Leonard J. Thompson, Wrentham, Mass., assignor to Value Oriented Technology Inc., Wrentham, Mass.

Filed Aug. 10, 1984, Ser. No. 639,419

Int. Cl.⁴ F16K *31/126*

U.S. Cl. 137—487.5 **11 Claims**



1. Function assist apparatus for a system pressure relief valve having a valve and valve body including a seat for the valve, said apparatus including

a spindle extension for the valve,

first and second fluid responsive means each having one end fixed in relation to the valve body and the other end engageable with the spindle extension, said first fluid responsive means being adapted upon the application of fluid pressure to apply an assisting force to the spindle extension in the opening direction of the valve, said second fluid responsive means having its said other end selectively engageable with or disengageable from the spindle extension and being adapted upon the application of fluid pressure to engage the spindle extension and apply an

assisting force thereto in the closing direction of the valve, and

a controller responsive to the system pressure and adapted to control the application of fluid pressure to said first and second fluid responsive means.

4,572,238

AUTOMATIC ADJUSTING VALVE FOR CONTROLLING FLUID FLOW

Stig Stenlund, Saltsjöbaden, Sweden, assignor to Hep Products AB, Alvsjo, Sweden

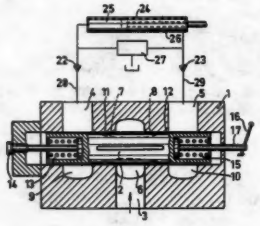
PCT No. PCT/SE83/00156, § 371 Date Dec. 22, 1983, § 102(e) Date Dec. 22, 1983, PCT Pub. No. WO83/03882, PCT Pub. Date Nov. 10, 1983

PCT Filed Apr. 22, 1983, Ser. No. 573,928

Claims priority, application Sweden, Apr. 23, 1982, 8202565

Int. Cl.⁴ F15B *13/04*

U.S. Cl. 137—625.3 **10 Claims**



1. In a controlled sliding valve including a valve housing with a cylindrical bore therein in which a slide member controlling hydraulic fluid flow reciprocates, the sealing surfaces between the slide member and bore form a sealing gap preventing fluid flow along the slide from one end of said surfaces to the second end of said surfaces wherein the gap converges from said one end to said second end, throttling edges and longitudinal flow control grooves in the slide member with variable cross-sectional area in the direction of movement of the slide member for controlling flow along the slide, a centering spring for resiliently urging the slide member toward the closing position, a central chamber in the housing and the bore with a port, a control chamber in said housing on each side of the central chamber communicating with a respective port and the bore, and sealing edges for each chamber in relative spaced relationship, the improvement comprising;

the central chamber communicates with either one of the control chambers through the flow control grooves in all adjusted positions;

said flow control grooves can be caused to open to only one of the sealing edges at a time;

the centering spring urges the slide member to return to the closing position from the adjusted positions where there is flow through the flow control grooves between said central chamber and one of said control chambers, the direction of said flow being in the converging direction of said sealing gaps; and

means to apply an opening adjusting force on said slide member in a direction opposite to the direction in which said centering spring urges said slide member;

so that the flow area through the valve is automatically adjusted by the force in the closing direction produced by the flow coupled with the combined forces of said centering spring and said opening adjusting force to maintain a substantially constant flow irrespective of pressure drop through the valve.

4,572,239

HIGH PRESSURE BALL VALVE

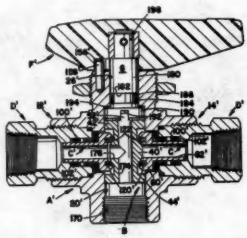
Ulrich H. Koch, Bainbridge Twp., Cuyahoga County; Peter C. Williams, Cleveland Heights, and Gilbert F. Lutz, Chesterland, all of Ohio, assignors to Whitey Co., Highland Heights, Ohio

Continuation of Ser. No. 297,220, Aug. 28, 1981, Pat. No. 4,479,513. This application Sep. 7, 1984, Ser. No. 648,132

The portion of the term of this patent subsequent to Oct. 30, 2001, has been disclaimed.

Int. Cl.⁴ F16K *5/06, 25/00*

U.S. Cl. 137—625.47 **17 Claims**



1. A high pressure ball valve comprising:

a valve body having a cylindrical first flow passageway and a cylindrical central passageway extending therethrough in a generally normal relative relationship and in communication with each other, the opposite ends of said first passageway defining a pair of valve body branches;

a valve closure member received in said central passageway and being selectively rotatable about the central passageway axis, said closure member having a spherical ball portion disposed in said first passageway and a pair of cylindrical trunnions disposed on opposite sides of said ball portion in said central passageway, said ball portion including a fluid passage therethrough and one of said trunnions including means for connecting said closure member to control means, that portion of said central passageway receiving the other of said trunnions defining a third valve body branch;

control means in operative communication with said valve closure member connecting means for allowing selective rotation of said closure member to move said fluid passage in said ball portion between valve open and closed conditions;

a pair of radially inward extending annular shoulders in said first passageway located generally equal distances from said ball portion, each said shoulder being circumferentially continuous and having a surface normal to the axis of said first passageway facing said ball portion;

a pair of seat ring carriers disposed in said first passageway with one of said carriers positioned at each area of communication of said first passageway with said central passageway, each carrier including an axial fluid flow opening therethrough and a radially outward extending annular face compatible with and facing the said surface of an associated one of said shoulders, said carriers each further including an annular seat ring receiving groove facing said ball portion and a cylindrical tail portion extending axially of said first passageway away from said ball portion in a radially inwardly spaced relation to said first flow passageway to form a cylindrical seal chamber;

a plurality of partially stressed disc springs interposed between each shoulder surface and the annular face of the associated carrier for urging said carriers axially of said first passageway toward said ball portion, each disc spring having a central opening and in its unstressed condition having a truncated conical shape, said disc springs being

positioned so that the smaller diameter ends of alternating ones thereof face in opposite directions;

a deformable annular seat ring closely received in the seat ring receiving groove of each carrier with said seat rings each including a continuous engaging surface facing said ball portion and wherein said engaging surface has a spherical conformation in its unstressed condition of a radius less than the radius of said ball portion, said seat ring engaging surfaces being urged into sealing contact so that said surfaces first contact with said ball portion at about the outer diameter of said surfaces during assembly and such contact widening from the outer diameter radially inwardly toward the inner diameter of said surfaces under the influence of said disc springs and fluid pressure loads, said sealing contact occurring at least at a diameter across the engaging surface of each seat ring which is smaller than the diameter across the associated seal chamber, said seat rings locating said closure member ball portion in said first passageway and retaining said closure member in said central passageway;

seal means interposed between each carrier tail portion and the valve body, in the associated seal chamber, and said seal means each including at least one annular seal ring adapted to be axially shifted between defined limits in response to fluid pressure exerted thereagainst; and,

said third branch comprising an upstream branch and said pair of seat rings comprising downstream seat rings with fluid pressure contacting either of said carriers adapted to further urge the associated seat ring toward engagement with said ball portion, the area which provides the net force of fluid pressure for such further urging being limited to a predetermined annular area defined between the outside diameter of the engaging band on each seat ring and the outside diameter of the associated carrier tail portion for preventing the application of destructive compressive loads to the seat rings.

4,572,240

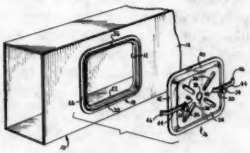
ACCESS DOOR CONSTRUCTION

Robert M. Van Becelaere, Johnson County, Kans., assignor to Philips Industrial Components, Inc., Dayton, Ohio

Filed Feb. 27, 1984, Ser. No. 584,009

Int. Cl.[4] F16L *55/10, 55/16*

U.S. Cl. 138—92 **15 Claims**



1. An access door construction for closing an access opening in a sheet metal ventilating duct conveying air under pressure, said opening having an exposed sheet metal edge, said door construction comprising:

a sheet metal door panel having a size to substantially cover the access opening and a peripheral sealing surface;

a gasket having a generally U-shaped hard portion providing spaced apart flanges applicable to said exposed edge with one flange inside the duct and the other outside the duct and a rigid rib interconnecting said flanges and spanning the exposed edge to reinforce and rigidify same, said gasket also including a relatively soft compressible sealing element extending from said hard portion substantially continuously around the access opening and projecting into the duct when said gasket is applied thereto; and

releasable means for retaining said door panel on the duct in a position to cover the access opening with said peripheral sealing surface of the door panel located inside of the duct and pushing outwardly against said sealing surface of the door panel located inside of the duct and pushing outwardly against said sealing element to effect a seal around the access opening, whereby the pressure in the duct acts against said door panel to enhance the effectiveness of said seal.

4,572,241

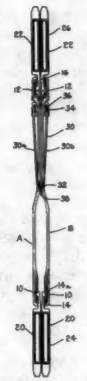
LENO HEDDLE DEVICE

Charles F. Kramer, Greenville, S.C., assignor to Steel Heddle Manufacturing Co., Greenville, S.C.

Continuation of Ser. No. 428,190, Sep. 29, 1982, abandoned. This application Nov. 20, 1984, Ser. No. 673,266

Int. Cl.[3] D03C *7/02*

U.S. Cl. 139—52 **2 Claims**



1. A lifting heddle for a loom comprising:

a first heddle element;

a second heddle element interfitted with said first heddle element;

each said heddle element including a C-shaped end member on opposing ends thereof defining a heddle rod slot for receiving a heddle rod and a shank extending between said C-shaped end members;

said C-shaped end member being defined by a back web, closed end portions terminating said web and extending outwardly therefrom, opposed fingers extending from said end portions towards one another terminating short of one another to define an open gap area;

said gap area being open sufficiently to enable said heddle to slide past a heddle rod connecting members when said heddle rod is received in said slot;

said rod slot including upper and lower slot portions defined on either side of said gap area;

a first of said C-shaped end members on one end of said first heddle element having one of said fingers thereof being longer than the other said finger, said one finger, said back web, and said end portion thereof defining an extended upper slot portion having a greater depth than the depth of said lower slot portion of said first C-shaped end member;

said one finger and said back web of said first heddle element including a laterally offset bend in an area of said extended upper slot portion of said first C-shaped end member defining a ledge;

said shank of said second heddle element including a neck of reduced width adjacent the lower C-shaped end portion;

a shoulder formed by an upper surface of said lower C-shaped end member of said second heddle element;

said slot of said second heddle element generally aligning with said slot of said first element with said shoulder of said second heddle element nesting alongside said ledge of said first heddle element;

said first heddle element including a medial opening formed in said shank for receiving said second heddle element therethrough;

said neck of said second heddle element fitting within said extended upper slot portion of said slot of said first heddle element whereby said first second and first heddle elements are fitted together as a lifting heddle, and said heddle elements being stamped from high carbon steel into their final shape.

4,572,242

HEALD FRAME ASSEMBLY

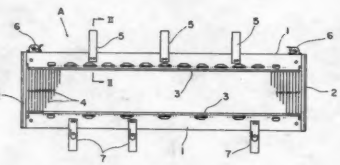
Yoichi Shimizu, Izumi, Japan, assignor to Maruyama Mfg. Co., Ltd., Osaka, Japan

Filed Oct. 30, 1984, Ser. No. 666,869

Claims priority, application Japan, Nov. 9, 1983, 58-173931[U]; Nov. 17, 1983, 58-177668[U]

Int. Cl.⁴ D03C *9/06*

U.S. Cl. 139—91 **2 Claims**



1. In a heddle frame of a loom including upper and lower staves having front and rear surfaces and spaced lateral supports, the combination comprising a pair of lockable guide plates of predetermined extent, each of said guide plates having lower portions adapted to engage said front and rear surfaces of said stave, one of said guide plates comprising a metal element having a main body portion, and further including at least top end and side locking means spaced from said main body portion and a complemental guide plate comprising a plastic element having a main body portion, said plastic element further including at least a pair of spaced means for locking engagement with said top end and said side locking means of said main body portion said pair of guide plates being lockable upon sliding movement thereof relative to said staves whereupon threaded fasteners are passsed through means defining apertures in said staves and said guide means.

4,572,243

SYSTEM AND APPARATUS FOR THE MEASUREMENT OF THE TENSION OF TEXTILE FABRICS IN TEXTILE MACHINES

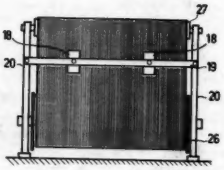
Ernst Felix, Uster, Switzerland, assignor to Zellweger Uster Ltd., Uster, Switzerland

Filed Jul. 8, 1983, Ser. No. 511,908

Claims priority, application Switzerland, Jul. 13, 1982, 4260/82

Int. Cl.⁴ D03D *49/00, 49/20;* G01L *5/04*

U.S. Cl. 139—97 **20 Claims**



1. A method for measuring tension on textile sheets in a textile machine for forming a textile fabric, wherein the tension is measured on a warp yarn sheet with warp yarns prior to weft yarns being inserted in the sheet, comprising the steps of subjecting predetermined ones of the warp yarns forming at least a part of the sheet to simultaneous transverse deflections, determining the speed of propagation of the simultaneous transverse deflections along the warp yarns, and determining specific warp tension in accordance with the determined speed of propagation.

12. An apparatus for measuring tension on textile sheets in the form of a warp yarn sheet in a textile machine for forming a textile fabric, comprising means for subjecting predetermined ones of warp yarns forming at least a part of the warp yarn sheet to simultaneous transverse deflections, means for determining the speed of propagation of the simultaneous transverse deflections along the sheet, and means for determining the specific warp tension on the sheet in accordance with the determined speed of propagation.

4,572,244

WARP LET-OFF MOTION FOR LOOM HAVING TWO WARP BEAMS

Shuichi Kojima; Masashi Nakao; Miyuki Gotoh; Takao Ishido, and Shuichiro Imamura, all of Tokyo, Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Aug. 28, 1984, Ser. No. 645,152

Claims priority, application Japan, Aug. 31, 1983, 58-157958

Int. Cl.⁴ D03D *49/06*

U.S. Cl. 139—103 **12 Claims**

1. A loom comprising:

left and right warp beams,

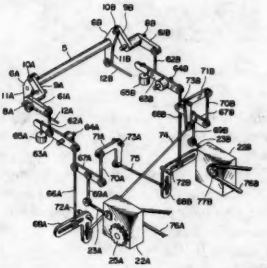
a tension roller through which warp threads of both of said left and right warp beams are delivered, said tension roller being supported at both ends,

left load sensing means for sensing a load acting at the left support point of said tension roller, and right load sensing means for sensing a load acting at the right support point of said tension roller,

left warp let-off speed regulating means for controlling the

rotational speed of said left warp beam, and right warp let-off speed regulating means for controlling the rotational speed of said right warp beam, and

control means, connected with said left and right load sensing means, for (i) detecting a left load deviation of the load sensed by said left load sensing means and a right load deviation of the load sensed by said right load sensing means, (ii) determining left and right tension deviations which represent, respectively, a deviation of a left total force applied by the tension of the warp threads of said left warp beam on said tension roller at a left application point and a deviation of a right total force applied by the tension of the warp threads of said right warp beam on said tension roller at a right application point and which are, respectively, left and right functions of the left and right load deviations, and so determine whether the left and right functions satisfy, at least approximately, both of a first relationship that the left load deviation, is equal to a



sum of the left tension deviation multiplied by a ratio of a distance between the left application point and the right support point to a span between the left and right support points and the right tension deviation multiplied by a ratio of a distance between the right application point and the right support point to the span and a second relationship that the right load deviation is equal to a sum of the left tension deviation multiplied by a ratio of a distance between the left application point and the left support point to the span and the right tension deviation multiplied by a ratio of a distance between the right application point and the left support point to the span, and (iii) controlling the rotational speed of the left warp beam in accordance with the left tension deviation by manipulating said left speed regulating means, and controlling the rotational speed of said right warp beam in accordance with the right tension deviation by manipulating said right speed regulating means.

4,572,245

ELECTROTHERMAL FABRIC MELT CUTTER FOR A WEAVING MACHINE

Lorant Gachsay, Zurich, Switzerland, assignor to Sulzer Brothers Limited, Winterthur, Switzerland

Filed May 22, 1984, Ser. No. 612,859

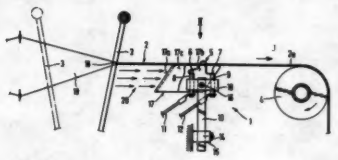
Claims priority, application Fed. Rep. of Germany, May 27, 1983, 3319194

Int. Cl.⁴ D03D *49/00*

U.S. Cl. 139—291 C **10 Claims**

1. An electrothermal fabric melt cutter for a weaving machine comprising

a heating wire having a severing portion for severing a moving fabric web; and



a shield disposed about said heating wire to shield said severing portion of said wire from reed-induced air flows.

4,572,246

WEFT YARN PRESENTING DEVICE FOR LOOMS

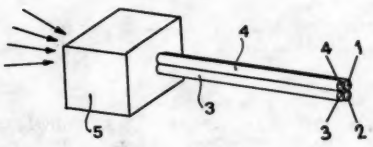
Fiorenzo Ghiaro, Vigliano Biellese, Italy, assignor to ROJ Electrotex S.p.A., Vercelli, Italy

Filed Mar. 26, 1984, Ser. No. 593,487

Claims priority, application Italy, Mar. 25, 1983, 20308 A/83

Int. Cl.⁴ D03D *47/30*

U.S. Cl. 139—435 **1 Claim**



1. A weft yarn presenting device for looms, comprising a plurality of nozzles joined in a bundle and carried by a body, two actuators each connected to the body, one said actuator moving the body reciprocally in only one direction, the other said actuator moving the body reciprocally in only one other direction, the two said directions being at right angles to each other, and means for selectively or simultaneously actuating said actuators, said nozzles being disposed in a square pattern, the sides of the square being parallel to said directions, whereby when the actuators are individually actuated they move the body in those directions and when they are simultaneously actuated they move the body along the diagonals of the square, each actuator comprising a head, means for moving said head only along the associated said direction, and means interconnecting each head with the body for relative sliding movement only in the other said direction.

4,572,247

SINGLE HEDDLE CONTROL DEVICE FOR A WEAVING MACHINE HAVING A SHEDDING APPARATUS

Francisco Speich, Gipf-Oberfrick, Switzerland, assignor to Textilma AG, Hergiswil, Switzerland

Filed Oct. 24, 1983, Ser. No. 544,597

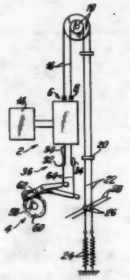
Claims priority, application Switzerland, Oct. 26, 1982, 6250/82

Int. Cl.⁴ D03C *13/00, 5/00, 3/20*

U.S. Cl. 139—455 **8 Claims**

1. A single heddle control device for a weaving machine having a shedding apparatus including one of a shaft drive and a shaft frame comprising: a selecting device including coupling means comprising a plurality of lifters each connected with a single heddle, each of said lifters comprising a carrier projection; means applying to each heddle a pretensioning force in one direction; reciprocating drive members each engaging one of said carrier projections for driving said heddles against the force of said pretensioning means; engagement detents formed in each of said lifters; pawl means engaging in said detents for

restraining movement of said lifters; electromagnetic means for disengaging said pawl means from said detents; and an electronic pattern control device for selectively controlling operation of said electromagnetic means; said reciprocating drive members each comprising a knife which is directly connectable with one of said shaft drive and said shaft frame of said shedding apparatus.

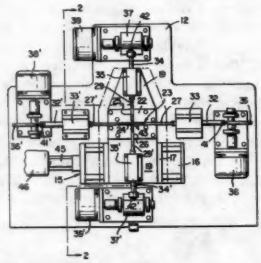


4,572,248

WIRE SHUFFLING APPARATUS AND METHOD

Warren J. Pegram, Greensboro, and Ronald G. Sergeant, Winston-Salem, both of N.C., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Dec. 30, 1983, Ser. No. 567,288
Int. Cl.[4] B21F *27/00*
U.S. Cl. 140—92.1 **9 Claims**



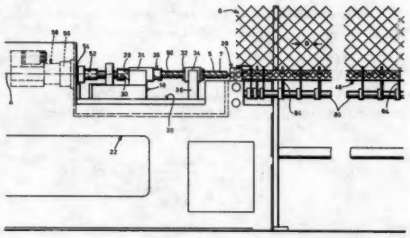
1. Apparatus for adding a wire at a preselected position in a row of wires extending side by side, in parallel relation and removing a preselected wire from the row of wires comprising a frame, means mounted on the frame defining a guidepath for the wires extending transversely of the wires in the direction of the row; means mounted on the frame defining an escapement for a wire extending transversely from the guidepath; opposed cooperative means in said escapement to move the wire perpendicularly of its axis from the row to the escapement and from the escapement to the row; opposed cooperative moving means in said guide path to urge the wires in a row along the guidepath closely together and to permit limited movement apart of the wires on the removal from and addition of a wire to the row, respectively; and, means mounted on the frame to move the escapement and the wire moving means relatively along the row into alignment with a preselected wire position for operation of the wire moving means.

4,572,249

APPARATUS FOR THE MANUFACTURE OF WIRE NET FABRIC

Gerhard Lange, Reutlingen, Fed. Rep. of Germany, assignor to Wafios Maschinenfabrik GmbH & Co. KG, Fed. Rep. of Germany

Filed Dec. 7, 1983, Ser. No. 558,971
Claims priority, application Fed. Rep. of Germany, Dec. 15, 1982, 3246381
Int. Cl.[4] B21F *27/04*
U.S. Cl. 140—92.6 **14 Claims**



1. Apparatus for the manufacture of a wire net fabric made from at least one straight supplied endless wire, said apparatus comprising:

a stationary twisting worm screw having a helical guide groove for holding said at least one supplied wire;

a flat coiling mandrel which cooperates with said twisting worm screw and which receives a flat-drawn coil formed from said at least one wire;

a circular twisting tube having an entrance which receives the coil from the mandrel;

drive means for rotating said mandrel about its longitudinal axis;

said drive means comprising hydro-motor means operatively connected for driving said coiling mandrel;

said drive means further comprising electro-hydraulic torque amplifier means, operatively connected to said hydro-motor means, for accelerating the rotational speed of said hydro-motor and thus of said coiling mandrel;

a source of hydro-oil;

a servovalve operatively connected to control the flow of oil to said hydro-motor;

step motor means, coupled to said servovalve, for adjusting the set point of said servovalve;

positioning means for producing signals determinative of desired operating conditions including rotational speed and acceleration of the mandrel of said coiling mandrel for predetermined points in time; and

a programmable function element connected to said positioning means for receiving signals from and cooperating with said positioning means in accordance with the master/slave principle for controlling said step motor means to operate said switch means such that said coiling mandrel is operated in accordance with said desired operating conditions over different points in time predetermined by said positioning means.

4,572,250

RIBBON CABLE WIRE END FORMING TOOL

Duane K. Maben, Clear Lake, Iowa, assignor to Sperry Corporation, New York, N.Y.

Continuation of Ser. No. 526,569, Oct. 14, 1983, abandoned, Division of Ser. No. 268,048, May 28, 1981, abandoned. This application May 23, 1985, Ser. No. 738,522
Int. Cl.[4] B21F *1/00*
U.S. Cl. 140—105 **20 Claims**

1. A method of segmenting a length by physically locating a plurality of movable elements demarking the end points of a

plurality of segments along said length, said method comprising:

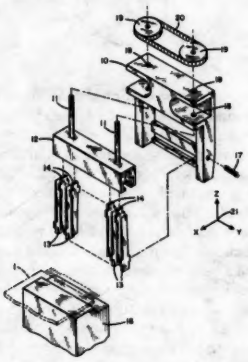
lining up linearly sequentially along said length a plurality of identical placeholding position-demarking first elements;

fixing a first sequential one of said plurality of first elements at a position demarking a first end of said length;

constraining the remaining linear sequentially lined-up ones of said first elements to a single degree of motional freedom along said length;

compressively forcefully biasing said constrained linear sequential lined-up ones of said first elements along said single degree of lengthwise motional freedom toward said fixed first sequential one of said plurality of first elements;

lining up linearly sequentially along said length a plurality, one less in number than said plurality of first elements, of identical wedge element means;



progressively interspersedly forcing all said plurality of wedge element means between all said plurality of first elements in order to evenly progressively spread by wedging said plurality of first elements against said compressive biasing until the last sequential one of said plurality of first elements moves to a position demarking a second end of said length; and

demarking segments within said length between a first end point which is one of said plurality of position-demarking first elements as are evenly justified along said length and a second end point which is any other one of said plurality of position-demarking first elements as are evenly justified along said length;

whereby said demarked segments are in length integral multiples of that common fraction of said whole length which is said whole length divided by the number of said plurality of wedge element means.

4,572,251

PNEUMATIC BAGGER RING

Geoffrey Drury, Canaan, Conn., assignor to Agrownautics, Inc., Salisbury, Conn.

Filed Dec. 20, 1983, Ser. No. 563,376
Int. Cl.⁴ B65B *1/04*
U.S. Cl. 141—1 **17 Claims**

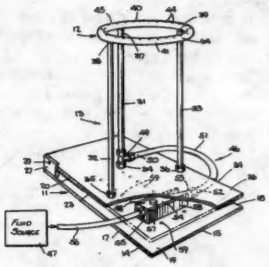
13. A method for placing an item into a pliant bag, the method comprising, in sequence:

(a) contacting an exterior surface portion of a pliant open-top bag against a vertically supported substantially horizontal hollow ring, the ring having an upper surface with a plurality of circumferentially spaced openings communicating with the hollow interior thereof and the outer circumference of the ring being less than the peripheral length of the open top of the bag;

(b) moving the open top of the bag toward and over the ring such that the edge of the open top passes by and exposes the interior surface of the contacted portion of the bag;

(c) pulling the open top of the bag downward around the ring so that the bag is turned inside out over the ring;

(d) placing an item within the ring in contact with the exposed inner surface of the bottom of the bag;



(e) moving the item downward through the ring in contact with the inner surface of the bottom of the bag to draw the top of the bag up, over, and through the ring, thereby turning the bag right side out with the item inside; and

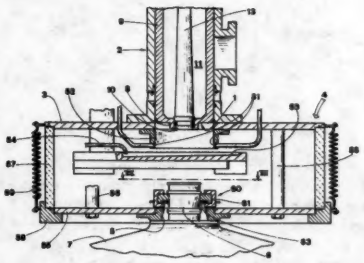
(f) supplying a flow of air from the hollow interior of the ring through said spaced openings during step (e) to decrease friction and adhesion between the exterior surface of the bag and the upper surface of the ring.

4,572,252

APPARATUS DESIGNED FOR FILLING CONTAINERS WITH LIQUID/PASTE SUBSTANCES UNDER STERILE CONDITIONS

Renato Ponzi, Corcagnano, and Martin Ellenberg, Pannocchia, both of Italy, assignors to El.PO s.r.l., Corcagnano, Italy

Filed Jan. 24, 1984, Ser. No. 573,490
Claims priority, application Italy, Feb. 2, 1983, 40008 A/83
Int. Cl.⁴ B67C *3/02*
U.S. Cl. 141—90 **5 Claims**



1. An apparatus for filling a container having a neck with liquid and/or paste material under sterile conditions comprising:

an enclosed chamber, said chamber having a top and a bottom, the bottom of said chamber defining an opening into which the container neck may be introduced;

a cylindrical tube located at said top of said chamber and communicating with the interior of said enclosed chamber;

a filler valve vertically reciprocable within said cylindrical tube and within said chamber, said filler valve having a projecting spout at one end and said spout being insertable within said container neck, said projecting spout defining an outlet orifice to allow said material to pass through said

orifice into said container when said container is to be filled;

a device which holds the container neck when the neck is introduced into the chamber bottom opening to maintain the container in vertical alignment with said filler valve;

means to close off said chamber bottom opening automatically whenever the container neck is not in the chamber bottom opening;

a bell-housing mounted within said chamber and disposed coaxially with said cylindrical tube and sized to permit the valve to slide vertically therethrough;

a plurality of nozzles located within said bell-housing and set to jet sterilizer fluid at said spout when the valve is raised out of contact with the container;

a drip-tray beneath said bell-housing, said drip-tray designed to gather both used sterilizer-fluid and particles removed from the valve; and

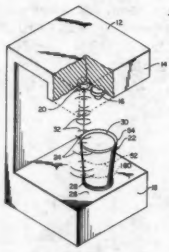
suction means positioned to draw off the fluid and material collected by said drip-tray.

4,572,253

AUTOMATIC LEVEL SENSING SYSTEM

M. Zane Farmer, and Diane B. Farmer, both of 12 Christmas Tree Dr., Ashburnham, Mass. 01430

Filed Jul. 19, 1984, Ser. No. 632,375
Int. Cl.[4] B65B *3/04*
U.S. Cl. 141—95 **25 Claims**



17. A level sensing system comprising:

ultrasonic sound wave transducer means for emitting ultrasonic sound waves and for receiving ultrasonic sound waves reflected from a receptacle whose content level is to be sensed;

a content level detector, responsive to said reflected ultrasonic sound waves, for detecting the level of the contents of the receptacle;

a rim detector, responsive to said reflected ultrasonic sound waves, for determining the location of the rim of the receptacle; and

a flow valve for controlling the level of the contents of the receptacle;

a receptacle detector, responsive to said rim detector, for actuating said flow valve when a receptacle is present; and

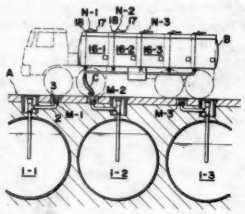
a level comparator, responsive to said rim detector and said contents level detector, for comparing the contents level with the rim location for de-activating said flow valve when the contents are within a predetermined distance of the rim.

4,572,254

LOCK SYSTEM PREVENTING MIXING OF DIFFERENT KINDS OF OIL AT GASOLINE STAND

Sozaburo Maeshiba, 1-33, 2-chome, Tani, Chuo-ku, Fukuoka, Japan

Filed Mar. 12, 1984, Ser. No. 588,210
Int. Cl.[4] E05B *65/00*
U.S. Cl. 141—98 **2 Claims**



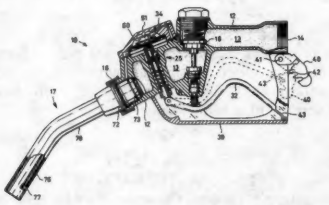
1. A lock system for preventing the mixing of different kinds of oil at a gasoline station, said lock system comprising: locks for different kinds of oils provided on each oil filler port of underground tanks of the gasoline station and each of the tank valves of a tank truck, wherein the lock on each of the filler ports of underground tanks can be unlocked by only a selected key which can also unlock only the corresponding tank valve of the tank truck; and keys separately provided for unlocking said locks for said different kinds of oil, said keys being stored in a key-storing device installed at the gasoline station, said key-storing device comprising means for permitting removal of only one key for one kind of oil at a time, so that only the filler port having a lock corresponding to the key, and only the tank valve having a lock corresponding to the key can be opened at a time.

4,572,255

LIQUID DISPENSING NOZZLE WITH A PUMP PRESSURE RESPONSIVE AUTOMATIC SHUT-OFF MECHANISM

Evsey Rabinovich, Erie, Pa., assignor to Alton Richards, Rockwood, Tenn. and Paul D. Carmack, Tipp City, Ohio

Filed Apr. 24, 1984, Ser. No. 603,519
Int. Cl.[4] B65B *3/28*
U.S. Cl. 141—217 **12 Claims**



12. A liquid dispensing nozzle for dispensing a liquid from a dispensing pump, said nozzle comprising:

a body defining an internal passageway, said passageway being provided with an inlet port for being releasably connected in fluid communication to said dispensing pump, and an outlet port, and further defining a plunger housing with in said body, said body being further provided with a cap member releasably mounted on said body, said cap member and said body defining a pressure chamber above said plunger housing;

a main valve mounted within said body between said inlet port and said outlet port for selectively opening and clos-

ing said passageway to the flow of said liquid, said main valve being normally biased to a closed position, said main valve being provided with an operating lever for selectively opening said main valve to the flow of said liquid;

a spout assembly secured to said outlet port of said body for selectively directing the flow of said liquid from said nozzle;

latch means for selectively closing and prohibiting the opening of said main valve, said latch means comprising a latch plunger slidably mounted within said plunger housing, said latch plunger being provided with a lower end portion for pivotally engages said operating lever, and being further provided with an upper end portion defining a latch pin receptor cup, said receptor cup being provided with a plurality of side wall openings each rotatably receiving a ball-latch, said latch means further comprising a latch pin for being slidably received in said receptor cup, whereby insertion of said latch pin into said receptor cup locks said latch means so as to allow the opening of said main valve;

first automatic shut-off means for selectively releasing said latch means so as to close and prohibit the opening of said main valve when supply pressure from said dispensing pump falls below a preselected value, said first automatic shut-off means comprising a diaphragm plunger secured to a pressure diaphragm, said diaphragm plunger and said pressure diaphragm transversly dividing said automatic shut-off chamber so as to define a pressure chamber, said diaphragm plunger engaging said latch pin such that selected movement of said diaphragm plunger away from said latch plunger removes said latch pin from said receptor cup and selected movement of said diaphragm plunger toward said latch plunger inserts said latch pin into said receptor cup, said diaphragm plunger being provided with spring biasing means for biasing said diaphragm plunger away from said latch plunger, said first automatic shut-off means further comprising a pressure conduit provided within said cap member and said body, said pressure conduit having a first end portion opening into said pressure chamber and a second end opening into said passageway between said main valve and said inlet port; and

further automatic shut-off means for closing said main valve when said liquid reaches the discharge end of said spout assembly, said further automatic shut-off means comprising a vacuum diaphragm mounted within said automatic shut-off chamber and transversely dividing said automatic shut-off chamber so as to define a vacuum chamber, said vacuum diaphragm being secured to said latch pin such that preselected movement of said vacuum diaphragm releases said latch means so as to selectively close and prohibit the opening of said main valve, said further automatic shut-off means further comprising a poppet valve provided with a poppet valve seat for generating a venturi effect, a vacuum conduit for connecting in fluid communication said vacuum chamber with said poppet valve seat, and a venting conduit for connecting in fluid communication said vacuum chamber with said discharge end of said spout assembly.

4,572,256

SAW MACHINE

Kauko Rautio, Kolmihaarantie, 52700 Mäntyharju, Finland

Filed Nov. 14, 1983, Ser. No. 551,172

Int. Cl.⁴ B27B *7/04, 25/02*

U.S. Cl. 144—39 **8 Claims**

1. A saw machine for ripping a log, comprising:

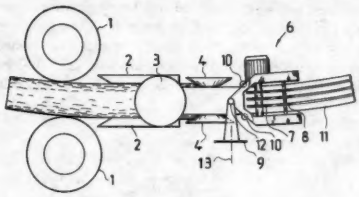
a sawing unit articulatedly attached to a frame member of the saw machine;

multiple circular parallel saw blades located rotatably in said sawing unit for ripping the log;

a parting knife located in said sawing unit after each said saw blade;

means for feeding the log through said sawing unit;

and dual guide rollers located ahead of the sawing unit, wherein the multiple saw blades and the parting knives located in said separate sawing unit articulated to the



frame member are guided by the parting knives to follow the crookedness of the log being ripped.

4,572,257

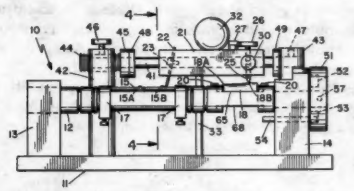
APPARATUS FOR PROFILING REEDS FOR DOUBLE-REED MUSICAL INSTRUMENTS

Edward B. Laker, 2116 Cook Pl., Ramona, Calif. 92065

Filed Nov. 13, 1984, Ser. No. 671,094

Int. Cl.⁴ B27C *1/14, 5/06*

U.S. Cl. 144—115 **9 Claims**



1. An apparatus for profiling a given section of reed stock according to the contour of a given profiling template, which comprises:

a base;

a reed support rotatably mounted on the base, the reed support including means for supporting a given profiling template and a given section of reed stock in fixed alignment for rotation about a common axis;

a cutting assembly mounted on the base adjacent the reed support, the cutting assembly including manually-operated means for shaving a selected portion of the section of reed stock with strokes generally parallel to the common axis according to a corresponding portion of the profiling template; and

means for enabling manual rotation of the reed support about the common axis to select the portion shaved.

4,572,258

CHAIN FLAIL

Kenneth J. Mischel, 1950 SW. Berry Lake Rd., Port Orchard, Wash. 98366

Filed Jan. 24, 1985, Ser. No. 694,943

Int. Cl.⁴ B27L *1/00*

U.S. Cl. 144—208 J **22 Claims**

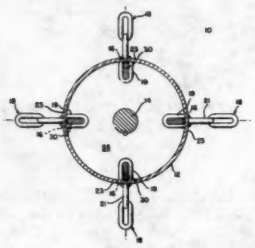
13. A flail device comprising:

a rotatable drum having a plurality of longitudinally spaced-apart openings;

a plurality of chain flails having a length of interconnecting chain links, with at least one of said flails passing through each of said drum openings and having at least one elongated attaching link toward an end of said flail and positioned within said drum;

at least one rod extending longitudinally within said drum

and positioned inward of said openings, said rod having a cross-sectional shape sized to substantially fill the interior aperture of said attaching link and extending through said attaching link aperture, said rod being positioned with its larger dimension oriented in the radial direction, said rod having hardened portions along the radially inward side thereof whereat said attaching links of said flail engage said rod and having unhardened portions radially outward



of said hardened portions to maintain the shear strength of said rod;

a plurality of guide plates rigidly attached to said drum for rotation with said drum, said guide plates have slots sized to removably receive and support said rod against deflection and for rotation with said drum; and

means for releasably retaining said rod within said drum and supported by said guide plates, and for selective withdrawal of said rod from said drum.

4,572,259

PLANING TOOL AND CUTTER THEREFOR

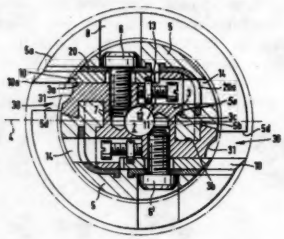
Otto Bergler, Mühlacker-Lomersheim, Fed. Rep. of Germany, assignor to Black & Decker Overseas AG, Vaduz, Liechtenstein

Filed May 11, 1984, Ser. No. 609,127

Claims priority, application Fed. Rep. of Germany, May 24, 1983, 3318799; May 24, 1983, 3318820

Int. Cl.⁴ B27G *13/00*

U.S. Cl. 144—230 **10 Claims**



1. A rotary planing tool for use with a plane having a drive means, said rotary planing tool comprising:

a center piece defining an axis of rotation and adapted to be rotatably driven by the drive means,

at least two replaceable cutters arranged symmetrically with respect to said axis of rotation,

a replaceable clamping flap associated with each said cutter, each flap including a proximate end disposed adjacent a cutting edge of the associated cutter and radially outwardly of such cutter, said flap extending circumferentially to a remote end of said flap disposed adjacent the cutting edge of the next said cutter,

each flap including an outer periphery shaped complementarily to the shape of the cutting edge,

a mounting bolt associated with each flap for securing such flap to said center piece,

said center piece and said remote end of each flap including mutually engaging shoulder means spaced circumferentially from the associated mounting bolt for positively connecting said flap to said center piece, said shoulder means arranged to block removal of said remote end from said center piece in a direction disposed parallel to longitudinal axis of said bolt and in a plane perpendicular to said axis of rotation.

4,572,260

VEHICLE WHEEL WITH INTERNALLY LOCATED EMERGENCY WHEEL

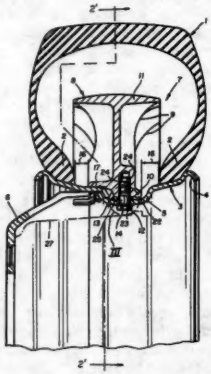
Armin Ordu, Schorndorf, Fed. Rep. of Germany, assignor to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Jun. 14, 1984, Ser. No. 620,726

Claims priority, application Fed. Rep. of Germany, Jun. 20, 1983, 3322097; Feb. 18, 1984, 3405970

Int. Cl.⁴ B60C *17/04*

U.S. Cl. 152—158 **11 Claims**



1. A vehicle wheel arrangement comprising a wheel rim formed to include a pair of radially outwardly facing tire support surfaces, the tire support surfaces being situated in axially spaced apart relation one to another, and a rim channel therebetween, the rim channel being formed to include at least one bolt-receiving aperture,

an inflatable vehicle tire including an interior surface and tire bead means for engaging the tire support surfaces in sealing relation,

a plurality of emergency wheel segments including foot means for engaging the rim channel to permit each wheel segment to be attached to the wheel rim and head means for engaging a portion of the interior surface of the vehicle tire during deflation thereof, the foot means being formed to include at least one bore for receiving a threaded bolt and seal retaining recess means for retaining a resilient sealing ring at an outer edge of each bore to permit preassembly of the sealing ring to accommodate subsequent assembly of each wheel segment to the wheel rim, said seal retaining recess means including a relief section means for retaining the sealing ring means in position on the segments during assembly, said relief section means including segment portions extending radially inwardly of the maximal radial width of the sealing ring means to overlap and retain the sealing ring means in position, and

attachment means for detachably attaching each wheel seg-

ment to the wheel rim, the attachment means including a threaded bolt for sequential reception in the bolt-receiving aperture, the resilient sealing ring, and the wheel segment bore to attach rigidly a companion emergency wheel segment in a mounted position on the wheel rim.

4,572,261

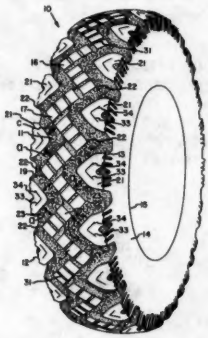
PNEUMATIC TIRE TREAD

Adrien Binsfeld, Colmar-Berg, Luxembourg, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Dec. 27, 1983, Ser. No. 565,785

Int. Cl.⁴ B60C *11/04*

U.S. Cl. 152—209 R **11 Claims**



1. A pneumatic tire having a tread portion comprising a pair of lateral edges which are spaced apart by a given tread width, a zig-zag rib extending circumferentially about the tire and centered axially with respect to the mid-circumferential plane of the tire and having an amplitude of between 60–70% of the tread width, said rib having a width of between 15–20% of the tread width when measured perpendicularly of a zig-zag center line of the rib, said rib having side faces thereon each of which is directed in one of the two rotational directions of the tire, the side faces each having a length of about 50% of the tread width, said rib being interrupted by a plurality of spaced shallow grooves which are perpendicular to the center line of the rib and have depths of between $\frac{1}{4}$ and $\frac{3}{4}$ of the tread depth, and a series of blocks located in the edge portions of the tread between adjacent peaks of the zig-zag rib, each of said blocks having a substantially triangular ground contacting surface.

4,572,262

VEHICLE WHEEL AND PNEUMATIC TIRE ASSEMBLY

Peter Entmayr, Burgdorf; Dieter Rohde, Lehrte, and Klaus Thielemann, Hildesheim, all of Fed. Rep. of Germany, assignors to Continental Gummi-Werke Aktiengesellschaft, Hanover, Fed. Rep. of Germany

Filed Dec. 7, 1984, Ser. No. 679,469

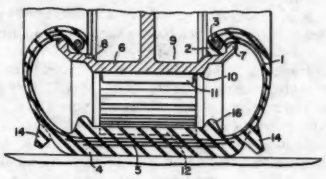
Claims priority, application Fed. Rep. of Germany, Dec. 15, 1983, 3345367

Int. Cl.⁴ B60B *21/00*

U.S. Cl. 152—501 **10 Claims**

1. A vehicle wheel and pneumatic tire assembly, which includes a tire made essentially of rubber or rubber-like synthetic material and having a tread and an inner wall, and also includes a rigid rim, the radially inner periphery of the rim ring of which has seating surfaces to allow mounting of said tire on said rim; the walls of said tire initially extend essentially horizontally outwardly from said seating surfaces; the radially outer periphery of said rim ring is provided with support surface means for supporting said tire during an emergency operation;

the improvement wherein said inner wall of said tire, in the region of said tread, and said support surface means, are both provided with alternating raised portions and recessed portions, which predominantly extend transverses



to the circumferential direction of said tire, and are adpated to interengage during an emergency operation of said tire.

4,572,263

PNEUMATIC RADIAL TIRE

Masaki Ogawa, Tokyo; Yasushi Hirata, Saitama, and Akira Tsuchikura, Tokyo, all of Japan, assignors to Bridgestone Corporation, Tokyo, Japan

Filed Dec. 1, 1983, Ser. No. 556,818

Claims priority, application Japan, Dec. 1, 1982, 57-209270

Int. Cl.⁴ B60C *9/18, 9/04;* B32B *25/10*

U.S. Cl. 152—537 **6 Claims**

1. A pneumatic radial tire comprising:

(1) a cylindrical tread portion;

(2) side portions located at both sides of the tread portion and extending inwardly in the radial direction;

(3) bead portions located at the inner edge portions of the side portions;

(4) a carcass comprising at least one ply which is reinforced with a belt arranged on the inside of the tread portion, wherein said belt, said carcass ply or both said belt and said carcass ply are reinforced by steel cords; and

(5) a rubber composition surrounding the steel cords, wherein said rubber composition comprises:

(a) 100 parts by weight of at least one rubber selected from the group consisting of natural rubber and dienic synthetic rubber;

(b) 0.1–5.0 parts by weight of alkadiene sulfone; and

(c) 0.05–1.0 parts by metal weight of at least one metal salt of an organic acid selected from the group consisting of cobalt salt of an organic acid and nickel salt of an organic acid.

4,572,264

PNEUMATIC RADIAL TIRES

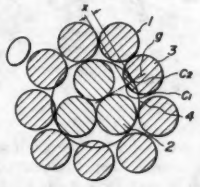
Yujiro Umezawa, Tokyo; Shigehisa Sano, Akigawa, and Takao Ogino, Tokorozawa, all of Japan, assignors to Bridgestone Tire Co., Ltd., Tokyo, Japan

Filed Dec. 15, 1983, Ser. No. 561,508

Claims priority, application Japan, Dec. 29, 1982, 57-230061

Int. Cl.⁴ B60C *9/00*

U.S. Cl. 152—451 **3 Claims**



1. A pneumatic radial tire comprising; a tire reinforcement

having steel cords each having a two or three layer construction represented by a designation of l+m or l+m+n, wherein l, m and n are an integer, respectively and satisfy a relation of l<m<n and l is an integer of 2 to 5, in which two layers at a center side of a transverse section in said steel cord represented by the designation of l+m have the same twisting direction but different twisting pitches, wherein m filaments constituting an outer layer among said two layers are arranged to enter into an inside of a circumscribed circle enveloping l filaments constituting an inner layer among said two layers at such a portion that the filaments of said outer layer do not come into contact with the filaments of said inner layer, and an average value $\bar{x}_o$ of a maximum value of an amount of entering a filament into the inside of the circumscribed circle per m filaments in the steel cord of a tire product satisfies the following equations:

$$(-0.24k^2+0.46k)d<x_O<(-0.73k^2+1.37k)d, \text{ when l is 2} \quad (1)$$

$$(-0.10k^2+0.24k)d<x_O<(-0.31k^2+0.73k)d, \text{ when l is 3} \quad (2)$$

$$(-0.05k^2+0.16k)d<x_O<(-0.15k^2+0.49k)d, \text{ when l is 4} \quad (3)$$

$$(-0.02k^2+0.12k)d<x_O<(-0.06k^2+0.35k)d, \text{ when l is 5} \quad (4),$$

wherein k is a ratio of twisting pitch P_1 of the filament of the inner layer to twisting pitch P_2 of the filament of the outer layer and d is a filament diameter, each of the m filaments in the outer layer has a form ratio of 90% to 110%, a limit entering amount $\bar{x}_L$ forms a ratio $\bar{x}_O/\bar{x}_L$ within a range of 0.33–1.0 wherein said limit entering amount $\bar{x}_L$ is represented by the following four equations:

$$x_L=(-0.73k^2+1.37k)d, \text{ when l is 2} \quad (5)$$

$$x_L=(-0.31k^2+0.73k)d, \text{ when l is 3} \quad (6)$$

$$x_L=(-0.15k^2+0.49k)d, \text{ when l is 4} \quad (7)$$

$$x_L=(-0.06k^2+0.35k)d, \text{ when l is 5} \quad (8)$$

wherein k and d are as defined above and wherein all l and m filaments have the same filament diameter d.

4,572,265

SINGLE-PIECE RIM HAVING TIRE MOUNTING NOTCH, AND METHOD OF MOUNTING THE TIRE THEREON

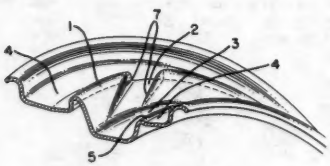
Claude Lescoffit, Chamalieres, France, assignor to Compagnie Generale des Etablissements Michelin, France

Filed Aug. 3, 1984, Ser. No. 637,519

Claims priority, application France, Sep. 15, 1983, 83 14819

Int. Cl.[4] B60B *21/10*; B60C *5/00*

U.S. Cl. 152—379.3 **7 Claims**



1. A rim for a vehicle wheel, of the single-piece type, having a mounting well located between two seats on each of which a tire bead is to be mounted, each seat being extended by a rim flange which extends radially and axially towards the outside of the rim, said rim being provided, between at least one of the two seats and the mounting well, with a stop for the axial retention of the tire bead spaced from the rim flange by a width at least equal to the width of the tire bead, said stop being provided with at least one notch, characterized by the fact that said notch has a width at least equal to the width of the tire bead, said notch is oriented at an angle α of between 10° and 90° with respect to the circumferential direction of the rim, and said notch is such that the rim radius measured at the outer surface of the rim at the place of the notch is always at most equal to the rim radius measured at the axially inner edge of the seat so that said notch can receive the tire bead and guide it from the mounting well up to its seat when the mounting is effected by relative rotation of the tire and the rim.

4,572,266

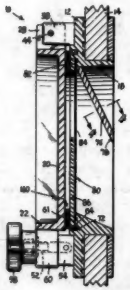
BOAT WINDOW

Frank S. Beckerer, Jr., 40 Dock Rd., Milford, Conn. 06460, and William F. Spangler, Milford, Conn., assignors to Frank S. Beckerer, Jr., Milford, Conn.

Continuation of Ser. No. 239,250, Mar. 2, 1981. This application Jul. 20, 1983, Ser. No. 515,470

Int. Cl.[4] E06B *3/30*

U.S. Cl. 160—92 **12 Claims**



6. A boat window, comprising in combination:

(a) a frame body comprising a molded plastic mounting flange for engagement with an inner surface surrounding an opening in the wall of a boat,

(b) said frame body including a molded plastic spigot connected with the flange and defining the window opening, said spigot being adapted to extend through said wall opening of the boat,

(c) a window pane for selectively closing off the window opening formed by the spigot,

(d) means hingedly connecting said window pane to the said molded plastic mounting flange,

(e) a removable window screen unit comprising a screen frame carried by the frame body of the boat window, said screen frame having in its lower portion a vertical water shield panel extending over and spanning the lower area of the screen frame to protect against splashes through the frame body when the window pane is open,

(f) said window screen unit having a mesh panel disposed permanently essentially coplanar with said water shield panel and extending between said vertical water shield panel and the upper edge of the screen frame, said mesh panel enabling air to circulate through the upper portion of the screen unit,

(g) said vertical water shield panel having an upper edge which borders said mesh panel,

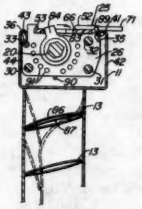
(h) said screen unit being removable from the frame body of the boat window as a unitary assemblage, such that the window can be equipped instead with a conventional screen, as desired.

4,572,267

VENETIAN BLIND WITH SELECTIVE TILT LIMITING

Carl Stein, New York, N.Y., and Harold M. Lewis, Montgomery, Pa., assignors to Marathon Manufacturing Company, Montgomery, Pa.

Filed May 15, 1984, Ser. No. 610,481
Int. Cl.[4] E06B 9/26
U.S. Cl. 160—176 R 7 Claims



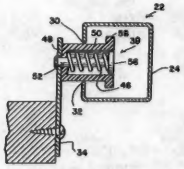
1. In combination with a venetian blind construction including a head rail, a rotary tilt rod in said head rail, ladder tapes connected to said tilt rod for movement therewith, and slats carried by said ladder tapes and tiltable upon rotation of said tilt rod, the improvement comprising a framework mounted in said headrail and having a central through opening rotatably passing said tilt rod, an arm extending from said tilt rod for rotation therewith, a pair of stop members selectively positioned relative to said framework on opposite sides of said arm and in the path of arm movement for limiting tilt rod rotation and slat tilting, said framework comprising a pair of spaced walls extending transversely of said rail and having aligned central openings for rotatably receiving said tilt rod, said arm extending from said tilt rod in the space between said walls, and said stop members extending between and into said walls; and a control member carried by said framework and having an arm opening receiving said arm, said arm opening having a pair of opposed edges located in the path of arm movement and defining said stop members.

4,572,268

ROLLER AND TRACK MEANS FOR AN OVERHEAD DOOR

Harold G. Wentzel, Union, Mich., assignor to Uneek Cap and Coor, Inc., Elkhart, Ind.

Division of Ser. No. 489,582, Apr. 28, 1983, Pat. No. 4,120,072.
This application Jun. 14, 1984, Ser. No. 620,577
Int. Cl.[4] E05D 15/06; A47H 15/02
U.S. Cl. 160—201 2 Claims



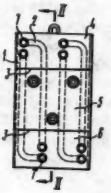
1. An overhead door which comprises track means and rollers affixed to the door by means of trunnion pins and adapted to roll in said track means, and which is mounted in a capped pickup truck in which said rollers are elongate cylinders adapted to rotate axially on said trunnion pins; said track means comprises tubular channels having members which have inner side surfaces normal to said trunnion pins and apposed free ends which constitute narrow, rolling surfaces on which said rollers roll; each said roller is spring-loaded axially by spring means and is provided with an inner flange adapted to abut said inner side surface to place said roller under spring bias when the roller is moved axially on its trunnion pin far enough for said flange and said inner surface to become engaged; and said channels being large enough relative to said flanges so that any roller can move axially relative to said rolling surfaces without its flange engaging an inner side surface.

4,572,269

METHOD OF MANUFACTURING COOLING PLATES FOR USE IN METALLURGICAL FURNACES AND A COOLING PLATE

Vladimir G. Ioshpa, Kharkov; Boris A. Kirievsky, Kiev; Anatoly P. Kravchenko, Zhdanov; Gennady A. Kudinov, Kharkov; Dorina B. Kutsykovich, Kharkov; Evgeny E. Lysenko, Kharkov; Anatoly A. Shokul, Zhdanov; Ignaty N. Nekrasov, Debaltsevo; Oleg V. Filipiev, Kharkov, and Vladimir P. Lugansky, Kiev, all of U.S.S.R., assignors to Vsesojuzny Nauchno-Issledova-Telsky I Proektny Institut Po Ochistke Tekhnolo, U.S.S.R.

PCT No. PCT/SU82/00003, § 371 Date Sep. 16, 1983, § 102(e) Date Sep. 16, 1983, PCT Pub. No. WO83/02578, PCT Pub. Date Aug. 4, 1983
PCT Filed Feb. 2, 1982, Ser. No. 537,411
Int. Cl.[4] B22D 19/04
U.S. Cl. 164—93 6 Claims



1. A method of manufacturing a cooling plate for a furnace, comprising the steps of

disposing at least one cooling pipe and a plurality of partitions in a mold, to divide the mold into three sections, an intermediate section and two outer sections,

pouring molten metal into the intermediate section,

allowing the molten metal to cool down to substantially ambient temperature,

after the molten metal has cooled to the substantially ambient temperature, pouring metal into at least one of the outer sections, and

prior to pouring molten metal into the one of the outer sections, disposing an expansion gasket adjacent the respective partition thereof.

4,572,270

METHOD AND APPARATUS FOR MANUFACTURING COMPOSITE MATERIAL USING PRESSURE CHAMBER AND CASTING CHAMBER

Kiyoshi Funatani; Tadashi Donomoto; Atsuo Tanaka, and Yoshiaki Tatematsu, all of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Sep. 29, 1983, Ser. No. 536,850
Claims priority, application Japan, Nov. 26, 1982, 57-207219
Int. Cl.[4] B22D 19/00
U.S. Cl. 164—97 21 Claims

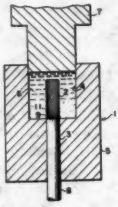
1. A method of manufacturing a composite material from a formed mass of reinforcing material and matrix metal, wherein in order:

(a) said formed mass of reinforcing material is introduced into a pressure chamber and is held therein;

(b) molten matrix metal is introduced into said pressure

chamber so as to surround said formed mass of reinforcing material being held therein;

(c) said formed mass of reinforcing material, while still being surrounded in said pressure chamber by said molten matrix metal, is moved from said pressure chamber into a



casting chamber of substantially smaller volume than said pressure chamber;

and

(d) while pressure is being applied, said molten matrix metal is allowed to solidify.

4,572,271

METHOD OF PRODUCING A MACHINE PART OF FIBER-REINFORCED COMPOSITE MATERIAL, THE FIBER-REINFORCEMENT BODY AND THE MACHINE PART

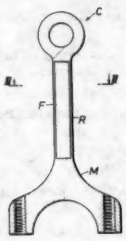
Waichiro Nakashima, Kawagoe; Hiroshi Sasaki, Hatoyama, and Katsuhiro Nishizaki, Tokorozawa, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 358,319, Mar. 15, 1982, abandoned. This application Jul. 10, 1984, Ser. No. 616,609

Claims priority, application Japan, Mar. 20, 1981, 56-40993

Int. Cl.[4] B22D *19/14*

U.S. Cl. 164—97 **11 Claims**



1. A method of producing a machine part of a fiber-reinforced composite material, said method comprising forming a fibrous shaped body by effecting a partial diffusion-bonding of a plurality of metallic fibers by copper solder; said fibrous shaped body having a bulk density of more than 2.0 and up to 5.0 g/cc and forming a mechanical part of fiber-reinforced composite material by integrating the fibrous shaped body with a matrix by high-pressure solidification.

7. A self-supporting fibrous shaped body adapted for forming a reinforcement in a non-copper matrix metal under high-pressure solidification, said fibrous shaped body comprising a plurality of metallic fibers at least partially diffusion-bonded by copper solder substantially over the entire extent of the shaped body.

9. A machine part comprising a non-copper matrix metal and a fibrous shaped reinforcing body integrated in said matrix metal, said fibrous shaped reinforcing body comprising a plurality of metallic fibers at least partially diffusion-bonded by copper solder over substantially the entire extent of said body, said fibrous shaped reinforcing body having a bulk density of more than 2.0 and up to 5.0 g/cc.

4,572,272

METHOD OF CASTING USING NON-SILICA BASED CERAMIC CORES FOR CASTINGS

David Mills, Bristol, England, assignor to Rolls-Royce Limited, Bristol, England

Filed Aug. 25, 1983, Ser. No. 526,490

Claims priority, application United Kingdom, Sep. 4, 1982, 82225259

Int. Cl.[4] B22D *29/00*

U.S. Cl. 164—131 **11 Claims**

1. A method of casting comprising the steps of:

making a core which contains between 90% and 99.5% by weight of a first, non-Silica based, ceramic material together with 10% to 0.5% by weight of a hydrogen donating second material which contains a Hydrogen donor group chemically bonded therein;

inserting the core into a casting mold;

pouring molten casting material into the mold, thereby surrounding the core, and allowing said casting material to solidify to form a cast component;

removing the cast component from the mold; and

contacting the core with a fused anhydrous caustic alkali to dissolve the core from within the component.

4,572,273

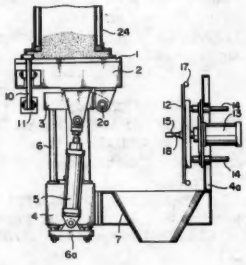
BLOW PLATE AND/OR BLOW NOZZLE AUTOMATIC CLEANING DEVICE

Seiji Katashima, Amagasaki, Japan, assignor to Naniwa Products Co. Ltd., Osaka, Japan

Filed Oct. 26, 1983, Ser. No. 545,544

Int. Cl.[4] B22C *19/00, 23/00*

U.S. Cl. 164—158 **4 Claims**



1. A blow plate and/or blow nozzle automatic cleaning device for use in a molding machine having a blow plate and/or blow nozzle comprising:

a blow plate turning and sand discharging device consisting of

(a) a fixed frame,

(b) a lifting frame,

(c) a lifting cylinder means attached to said fixed frame and said lifting frame for vertically lifting said lifting frame relative to said fixed frame,

(d) a turning frame located above said lifting frame,

(e) a fulcrum means for mounting said turning frame to one side of said lifting frame for 90° turning of said turning frame relative to said lifting frame, and,

(f) a blow plate holding means attached to said turning frame for releasably holding the blow plate to said turning frame;

a compressed air injection mechanism arranged adjacent to said one side of said lifting frame; and

a moving means for moving said compressed air injection means horizontally toward said one side of said lifting

frame whereby after said lifting frame is lifted and the blow plate is held to and turned with said turning frame, said compressed air injection mechanism is moved toward the blow plate to completely clean the blow plate.

4,572,274

DEVICE FOR COMPACTING GRANULAR MOLDING MATERIALS

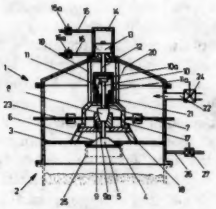
Rainer Zimmermann, Eschenz, Switzerland, assignor to Georg Fischer Aktiengesellschaft, Switzerland

Filed Oct. 25, 1983, Ser. No. 545,219

Claims priority, application Switzerland, Oct. 27, 1982, 6268/82

Int. Cl.[4] B22C *15/00*

U.S. Cl. 164—169 14 Claims



1. An apparatus for compacting granular molding materials, particularly foundry molding materials, by a surge of pressure of a gaseous medium, comprising:

a pressure chamber having coupling means, mounted at an outlet of said pressure chamber, for forming a closed system with a molding unit in which molding material has been loosely poured;

a passage providing fluid communication between said pressure chamber and said outlet, and having a valve seat facing away from said pressure chamber;

a valve member moveable between an open position spaced from said valve seat and a closed position engaging said valve seat and closing said passage;

a valve rod coupled to said valve member and controlling movement thereof; and

closure means, coupled to said valve rod, for moving said valve member from said open position toward said closed position;

holding means for releasably engaging and retaining said valve rod such that said valve member is held in said closed position and for releasing said valve rod and said valve member for movement to said open position by fluid pressure in said pressure chamber, said holding means being separate from and independent of said closure means;

whereby said passage is quickly opened for passage of fluid pressure from said pressure chamber to the molding unit.

4,572,275

APPARATUS FOR USE IN CASTING AN ARTICLE

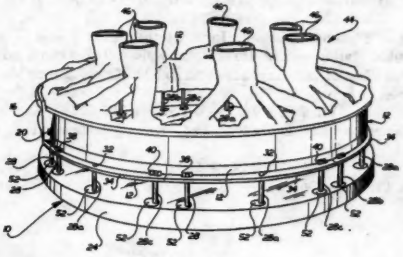
William S. Blazek, Valley City, Ohio, assignor to TRW Inc., Cleveland, Ohio

Continuation of Ser. No. 157,020, Jun. 6, 1980, abandoned, which is a division of Ser. No. 869,219, Jan. 13, 1978, Pat. No. 4,224,976. This application Apr. 9, 1985, Ser. No. 721,148

Int. Cl.[4] B22D *33/00, 33/04*

U.S. Cl. 164—339 7 Claims

7. An apparatus for use in casting an article, said apparatus comprising a plurality of mold wall sections, a base, support means connected with said base for supporting the plurality of mold wall sections above said base in a circular array with side portions of the plurality of mold wall sections cooperating to define a circular side area of a mold cavity having the configuration of an article to be cast and with the lower end portions of the plurality of mold wall sections spaced from said base to provide access to lower end portions of said mold wall sections, said support means including a plurality of upstanding pin members disposed on said base, each of said pin members having end surface means for engaging a downwardly facing surface area on a lower end portion of one of the mold wall sections and side surface means for engaging a sidewardly facing surface area on the lower end portion of the one mold



wall section, said side surface means extending transversely to said end surface means, and adjusting means for adjusting the orientation of one of the mold wall sections relative to an adjacent mold wall section, said adjusting means including means for moving one of said pin members relative to said base to change the position of the lower end portion of the one mold wall section relative to the lower end portion of the adjacent mold wall section when the mold wall sections are disposed in a circular array on said pin members.

4,572,276

SCROLL MANUFACTURING TOOL

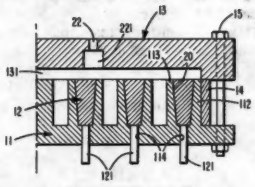
Seiichi Hukuhara, Gunma, Japan, assignor to Sanden Corporation, Gunma, Japan

Division of Ser. No. 353,830, Mar. 2, 1982, Pat. No. 4,456,051. This application Jan. 25, 1984, Ser. No. 573,669

Claims priority, application Japan, Mar. 2, 1981, 56-28312

Int. Cl.[4] B22D *17/26*

U.S. Cl. 164—342 4 Claims



1. A manufacturing tool for making a scroll for use in a scroll type fluid displacement apparatus comprising:

(a) a molding member having an end plate and two involute wall elements extending from one side surface of said end plate to define two involute grooves having open ends opposite said end plate, a first of said two grooves having a wedge-shaped axial cross-sectional configuration, and a second of said involute grooves having a substantially rectangular-shaped axial cross-sectional configuration to define a space within which a spiral element of the scroll with a substantially rectangular axial cross-sectional configuration is formed;

(b) an insertion member having a wedge-shaped axial cross-sectional configuration mating with the axial cross-sectional configuration of said first involute groove removably disposed within said first involute groove; and

(c) a second molding member having an indentation in its

axial end surface facing said first and second involute grooves, said second molding member being secured over said first molding member during the manufacturing process to define a space within which an end plate of the scroll is formed.

4,572,277

ARRANGEMENT FOR REMOTE ADJUSTMENT OF THE DIMENSIONS OF A STRAND DURING CONTINUOUS CASTING

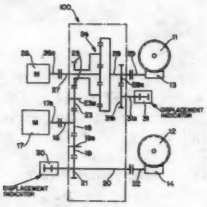
Günter Fleming, Erkrath; Horst Grothe, Kaarst; Rolf Haselhuhn, Ratingen, and Hans-Peter Kaiser, Düsseldorf, all of Fed. Rep. of Germany, assignors to SMS Concast Inc., Montvale, N.J.

Filed Feb. 26, 1985, Ser. No. 705,552

Claims priority, application Fed. Rep. of Germany, Feb. 29, 1984, 3407294

Int. Cl.⁴ B22D *11/10*

U.S. Cl. 164—436 **16 Claims**



1. An arrangement for remotely adjusting a movable wall of a continuous casting mold during casting to change the dimensions of a continuously cast strand, said arrangement comprising:

(a) a first displacing unit designed to be articulated to a first portion of the wall, said first unit including a first displaceable element;

(b) a second displacing unit designed to be articulated to a second portion of the wall, said second unit including a second displaceable element;

(c) a motor common to and designed to drive said elements;

(d) a first transmission for transmitting motion from said motor to said first element;

(e) a second transmission for transmitting motion from said motor to said second element; and

(f) a coupling device for coupling said transmissions to one another and to said motor, one of said elements being arranged so as to be adjustable independently of the other of said elements.

4,572,278

METHOD FOR CENTRIFUGAL CASTING

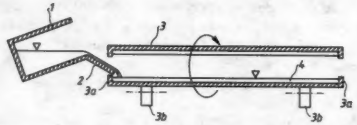
Yngve Sundberg, Västerås, Sweden, assignor to ASEA Aktiebolag, Västerås, Sweden

Filed Dec. 21, 1983, Ser. No. 563,826

Claims priority, application Sweden, Jan. 28, 1983, 8300436

Int. Cl.⁴ B22D *13/00*

U.S. Cl. 164—457 **1 Claim**



1. A method for centrifugally casting a cylindrical tubular shape in a cylindrical rotating mold having inwardly extending end flanges and a controllable rotation speed, the mold forming a casting with a substantially even wall thickness when rotated at a mold rotating mean speed, comprising pouring a melt of molten metal into one end of the rotating mold so the melt fills-in the mold to form a melt volume in the mold providing a desired wall thickness for the cast shape, the pouring melt while filling-in the mold forming a wave front flowing to the other end of the mold and against the flange at that end, the wave front having a velocity dependent on the mold's rotation speed, and controlling the rotation speed of the mold during filling-in with the melt to a speed substantially slower than said mean speed and holding the velocity of said wave front low enough to prevent the wave front from reacting with the flange at said other end of the mold and propagating a wave motion in the melt causing the filling-in melt to form into a spiral shape in the mold, the lower rotation speed being maintained at least at a speed high enough to centrifugally hold the melt on the inside of the mold during filling-in of the mold, and after the filling-in of the mold and the melt is substantially free from said wave motion and before the melt solidifies, increasing the mold's rotating speed to a higher speed which varies above and below said mean rotating speed at a frequency causing the outer portion of the melt closest to the mold to substantially correspondingly vary in rotation speed while the inside portion of the melt lags in its rotation speed relative to that of the outer portion and stirs together said portions of the melt during solidification, preventing premature solidification of said outer portion and formation of blisters in the as-cast tubular shape.

4,572,279

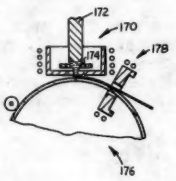
ELECTROMAGNETIC SHAPING OF THIN RIBBON CONDUCTOR STRIP CAST ONTO A CHILL WHEEL

Brian G. Lewis, Branford, and John V. Patton, New Haven, both of Conn., assignors to Olin Corporation, New Haven, Conn.

Filed Feb. 27, 1984, Ser. No. 584,281

Int. Cl.⁴ B22D *11/00*

U.S. Cl. 164—463 **38 Claims**



21. An apparatus for producing a thin ribbon of material, comprising:

a moving chill block;

means disposed adjacent said chill block for feeding said material onto said chill block;

means associated with the feed means for generating a first electromagnetic field to heat said material in the solid condition into a molten drop and to shape said molten drop into a thin ribbon shape prior to contact of said molten material with said chill block; and

means adjacent said chill block for generating a sixth electromagnetic field to apply pressure to the molten material to squeeze the deposited molten material on said chill block into said thin ribbon of material.

36. The process of producing a thin ribbon of material comprising the steps of:

providing a moving chill block;

generating a fifth electromagnetic field to heat said material in the solid condition into a molten drop;

generating a fourth electromagnetic field to shape said molten drop into a thin ribbon shape of molten material prior

to contact of said thin ribbon of said molten material with said chill block; and

feeding said material onto said chill block.

4,572,280

PROCESS FOR COOLING A CONTINUOUSLY CAST INGOT DURING CASTING

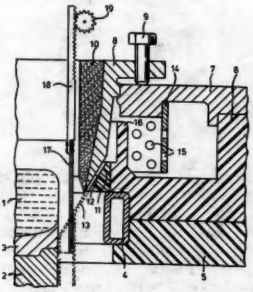
Walter Haller, Sierre, Switzerland, assignor to Swiss Aluminium Ltd., Chippis, Switzerland

Continuation of Ser. No. 359,895, Mar. 19, 1982, abandoned. This application May 9, 1984, Ser. No. 608,487

Claims priority, application Switzerland, Apr. 2, 1981, 2245/81

Int. Cl.[4] B22D *11/00*

U.S. Cl. 164—467 21 Claims



1. A process for electromagnetically continuously casting molten metal comprising:

providing a support frame;

providing an inductor associated with said support frame for applying a magnetic field to the molten metal to define a mold cavity;

providing a screen associated with said support frame for adjusting the magnetic field applied by said inductor;

providing coolant supply means including at least one discharge nozzle defined by a portion of said support frame and said screen for feeding a coolant stream to a first location of impingement on a surface of a cast ingot;

continuously casting metal into said mold cavity to produce a continuous casting;

providing deflecting means separate from said coolant supply means and remote and downstream of said at least one discharge nozzle defined by a portion of said support frame and said screen for controlling the position and angle of at least a portion of the coolant stream by deflecting and redirecting said at least a portion of said coolant stream emanating from said at least one discharge nozzle to a second location, taken along a direction of casting withdrawal, relatively below said first location of impingement of a stream emanating from said discharge nozzle; and

deflecting and redirecting said at least a portion of said coolant stream from said first location such that the coolant is jetted as streams in zones which are separate from each other to said first location.

4,572,281

METHOD AND ARRANGEMENT FOR RECOVERING THE SENSIBLE HEAT OF SLAG

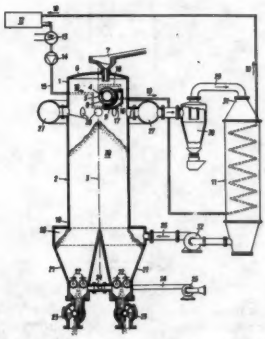
Paul Müllner, Traun, and Bernhard Enkner, Linz, both of Austria, assignors to Voest-Alpine Aktiengesellschaft, Linz, Austria

Filed Nov. 14, 1983, Ser. No. 550,945

Claims priority, application Austria, Nov. 16, 1982, 4170/82

Int. Cl.[4] F27D *15/02, 3/14;* F22B *1/02*

U.S. Cl. 165—1 5 Claims



1. In a method for recovering the sensible heat of slag, such as blast furnace slag, in which slag in a liquid state is solidified on the surface of a hollow cooling body, preferably designed as a cooling drum, and provided with a liquid internal cooling means comprising a liquid cooling medium, said slag being indirectly cooled by said liquid internal cooling, and said liquid cooling medium of said liquid internal cooling means is guided in a liquid-cooling-medium thermodynamic cyclic process, the improvement comprising the steps of

indirectly intensively cooling the liquid slag on the surface of said cooling body by said liquid cooling medium to a temperature closely below the solidification temperature in a first cooling step so as to solidify said slag throughout,

separating said solidified slag from the surface of said cooling body,

obtaining a heated gas flow by directly cooling said separated solidified slag in a second cooling step by a gas flow, and

leading said heated gas flow in a gas-flow thermodynamic cyclic process.

4,572,282

VENTILATION SYSTEM FOR BUILDING

Akio Ikemura, Kurobe, and Minoru Kajiki, Toyama, both of Japan, assignors to Yoshida Kogyo K.K., Tokyo, Japan

Filed Oct. 20, 1983, Ser. No. 543,603

Claims priority, application Japan, Oct. 20, 1982, 57-184270

Int. Cl.[4] F28D *19/00*

U.S. Cl. 165—54 22 Claims

1. A combined window and ventilation system module for a building, comprising:

(a) a window unit including a window frame having a window opening adapted to support a window, said window frame further having with it

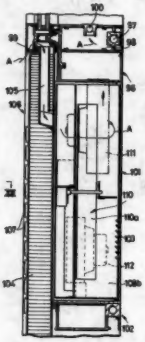
(1) at least one first internal passage remote from said window opening for conducting a fluid-transfering medium, and

(2) at least one second internal passage for air remote from said window opening, and disposed in heat-exchange relationship to said first passage;

(b) a ventilator supported by said frame and disposed adjacent to said window opening and having a heat-exchang-

ing element disposed therein, said ventilator being also held in air flow communication with said second internal frame passage;

(c) a fresh air inlet and a fresh air outlet disposed on the exterior and interior sides of the window unit respectively, and communicating with said second passage through said ventilator; and



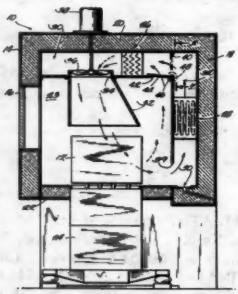
(d) a foul air inlet and a foul air outlet disposed on the interior and exterior sides of the window unit respectively and communicating with each other by a third passage extending through said ventilator independently of the flow of fresh air.

4,572,283

ENVIRONMENTAL TEST CHAMBER

Donald Vanderschaaf, Holland, Mich., assignor to Wehr Corporation, Milwaukee, Wis.

Filed Aug. 31, 1984, Ser. No. 646,699
Int. Cl.[4] F25B *29/00*
U.S. Cl. 165—61 9 Claims



1. A test chamber device comprising

a generally enclosed chamber, and

means for circulating and alternatively heating and cooling the air in said chamber, said means including

alternatively operable heating means and refrigerating means,

a first duct having said heating means therein and including a first end communicating with said chamber, and a second end,

a second duct having said refrigerating means therein and including a first end, and a second end communicating with said chamber, and

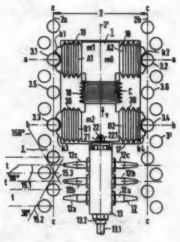
means for selectively connecting said secopd end of said first duct to said first end of said second duct when said refrigerating means is operating, and for selectively isolating said refrigerating means when said heating means is operating by opening said second end of said first duct to said chamber and closing said first end of said second duct.

4,572,284

TUBE LANE MANIPULATOR, SPRAYING HEAD AND CORRESPONDING SPRAYING METHOD FOR THE HIGH-PRESSURE BLOWDOWN OF HEAT EXCHANGERS

Erich Kätscher, Marloffstein; Johannes Stoss, Erlangen; Robert Weber, Uttenreuth; Dieter Zöberlein, Heiligenstadt; Jakob Weber, Baiersdorf-Hagenau, and Josef Forster, Erlangen, all of Fed. Rep. of Germany, assignors to Kraftwerk Union Aktiengesellschaft, Mulheim an der Ruhr, Fed. Rep. of Germany

Filed Jan. 25, 1983, Ser. No. 460,859
Claims priority, application Fed. Rep. of Germany, Jan. 25, 1982, 3202248
Int. Cl.[4] F28G *15/00*
U.S. Cl. 165—95 23 Claims



1. Tube lane manipulator for the high-pressure blowdown of heat exchangers having tubes being spaced apart by a given pitch forming tube lanes therebetween with tubes on opposite sides and having closeable servicing openings formed therein providing access to the tube lanes, comprising a car being insertible into the tube lanes through the servicing openings and being movable therein by remote control, a spraying head being supported on said car and having nozzles with orifices for spraying jets of blowdown water in a given direction into spaces between the tubes, suction lines having suction stubs for pumping off accumulated blowdown water, and extendible and retractible clamping feet disposed on said car for clamping said car to the tubes on at least one side of a tube lane along a clamping plane in conformity with the given tube pitch, said nozzles being positioned in spraying positions of a spraying position sequence by said clamping feet clamping said car, said given spraying direction from said orifices of said nozzles being adjusted to the given tube pitch and said nozzles being spaced from said clamping plane by a distance being adjusted to the given tube pitch for spraying the jets of water into the spaces between the tubes.

4,572,285

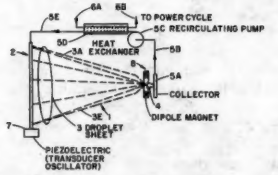
MAGNETICALLY FOCUSED LIQUID DROP RADIATOR

Thomas E. Botts, Fairfax, Va.; James R. Powell, Shoreham, N.Y., and Roger Lenard, Redondo Beach, Calif., assignors to The United States of America as represented by the Department of Energy, Washington, D.C.

Filed Dec. 10, 1984, Ser. No. 679,841
Int. Cl.[4] F28D *15/00*
U.S. Cl. 165—104.28 17 Claims

1. A liquid droplet radiator having a droplet generator for producing directed streams of droplets, a collector spaced from the generator to collect the streams of droplets directed toward it from the generator, and fluid handling means for withdrawing fluid from the collector and delivering it to the generator under pressure, in combination with the improvement comprising a magnetizable liquid or slurry in said genera-

tor and in said means for withdrawing and delivering liquid, and magnetic means disposed in operative relationship to said collector for producing a magnetic flux field that extends into



areas located transversely outward from the straight-line droplet stream "miss" path beyond the collector and is effective to focus and accelerate said streams of droplets, thereby to direct them from said areas into said collector.

4,572,286

BOILING COOLING APPARATUS

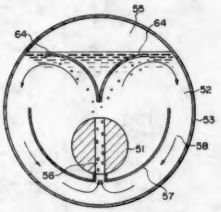
Masao Fujii; Kazushige Nakao, and Haruo Tetsuno, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 7, 1982, Ser. No. 366,124

Claims priority, application Japan, Apr. 7, 1981, 56-53466; Dec. 22, 1981, 56-208648; Dec. 22, 1981, 56-208849

Int. Cl.[4] F28D *15/00;* **H01F** *27/10*

U.S. Cl. 165—104.29 **3 Claims**



1. A boiling cooling apparatus having a liquid coolant, a heat generating element immersed in the liquid coolant, a container for accommodating said liquid coolant and heat generating element, a first passageway provided in said heat generating element so that the bubbles of said liquid coolant formed by the heat produced from said heat generating element flow upwardly through said first passageway, a guide positioned in the upper part of the liquid coolant in said container so as to prevent the rippling of the liquid coolant caused by the ascending flow of intermingled liquid coolant and bubbles that pass through the first passageway and baffle means surrounding the sides of said element in spaced relation to the inner wall of the container to define a second passageway whereby said liquid coolant is induced to flow downwardly in contact with the inner wall of said container by the force developed by the ascending flow of said bubbles and wherein said baffle means is connected to the bottom of said first passageway so that the descending flow of said liquid coolant is directed to the first passageway.

4,572,287

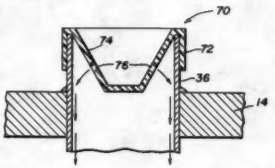
FALLING FILM HEAT EXCHANGER WITH FILM FORMING MEMBERS

Vincent F. Allo, Warrenville, and Donald C. Stafford, Hinsdale, both of Ill., assignors to Chicago Bridge & Iron Company, Oak Brook, Ill.

Continuation-in-part of Ser. No. 481,829, Apr. 4, 1983, abandoned. This application Apr. 26, 1984, Ser. No. 604,149

Int. Cl.[4] F28D *3/02*

U.S. Cl. 165—118 **5 Claims**



1. A falling film heat exchanger comprising:

a shell connected to vertically spaced apart horizontally arranged circular upper and lower tube sheets;

a plurality of vertically positioned parallel circular cylindrical tubes, with each tube extending through and connected to a hole in each tube sheet;

means to feed a heat exchange fluid to the shell side of the heat exchanger and means to withdraw the heat exchange fluid from the shell side of the heat exchanger;

on the upper end of each tube, a cap comprising a cap body having a cap central axis coincident to a central axis of each tube;

the cap body including a central shell portion concave in an axial direction when viewed from the top of the cap;

the cap body being solid material except for a plurality of spaced apart holes extending through said cap body central shell portion in a radially downward direction and with the holes providing the only access to the tube interior;

said holes having wall surfaces extending for the full thickness of the cap body where they extend through the cap solid material so that liquid is supplied, in full liquid flow through the holes, directly from the distribution box to the tube internal wall as a multiplicity of discrete liquid streams which are shaped, formed and aimed only by the holes in the cap body.

4,572,288

TIME-DELAYED IGNITION SYSTEM FOR A DOWN-HOLE EXPLOSIVE TOOL

Karl S. Kinley, Houston, Tex., assignor to J. C. Kinley Co., Houston, Tex.

Filed Jun. 15, 1984, Ser. No. 621,079

Int. Cl.[4] E21B *29/02, 43/1185*

U.S. Cl. 166—63 **12 Claims**

1. An apparatus for providing a time-delayed activation of a down-hole explosive tool, comprising:

a longitudinal housing adapted to be dropped in a well without being suspended from an electrical conductive line;

an explosive adapted to actuate the explosive tool;

means disposed within said housing for supplying electrical current to said housing;

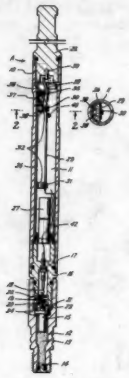
an electrical igniter disposed within said housing;

means for positioning said igniter in proximity to said explosive for detonating said explosive;

said igniter being operable to activate the down-hole explosive tool by applying said current to said igniter; and

means disposed within said housing for delaying application of said current to said igniter for a predetermined period of time, said delaying means including: a manually opera-

ble switch having an "off" position for preventing said application of said current and an "on" position for beginning said period of delay, and means for locking said switch in either of said positions.

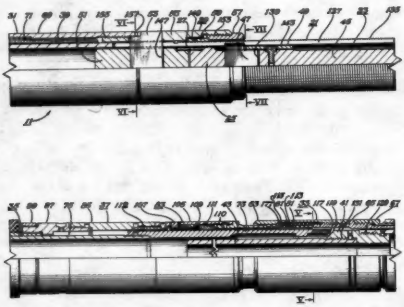


4,572,289

ELECTRIC WIRELINE PACKER RETRIEVER APPARATUS

Wayne O. Rosenthal, Fort Worth, Tex., assignor to Pengo Industries, Inc., Fort Worth, Tex.

Filed Nov. 5, 1984, Ser. No. 668,099
Int. Cl.[4] E21B *23/00*
U.S. Cl. 166—123 **16 Claims**



9. A packer retrieving tool for use in retrieving a retrievable packer of a type that is set by the application of "pull-push" force which may be derived from a conventional electric wireline setting tool of the pressurized type comprising:

a. a support sleeve assembly adapted for attachment of its upper end portion to a conventional electric wireline setting tool of the pressurized type so as to transmit "push" force to the support sleeve assembly when the setting tool is actuated; having centering shoe means at its lower end adapted for bearing on an upper end surface of said packer so as to exert said "push" force on the packer mandrel body;

b. a tension mandrel assembly disposed within said support sleeve assembly and adapted for attachment at its upper end to said setting tool so as to transmit "pull" force to the tension mandrel assembly when said setting tool is actuated;

c. a cross link mandrel assembly disposed within said support sleeve assembly beneath and adjacent said tension mandrel assembly and releasably attached to said tension mandrel assembly by tension release means;

d. a ratchet lock assembly disposed exteriorly of said support sleeve assembly;

e. a retrieving grapple assembly disposed exteriorly of said support sleeve assembly beneath said ratchet lock assembly;

f. means connecting said retrieving grapple assembly to said ratchet lock assembly;

g. radially disposed support sleeve assembly slot means extending longitudinally of said ssembly:

h. ratchet means on said support sleeve assembly and extending longitudinally thereof and cooperating with said ratchet lock assembly to provide one way upwardly ratcheting movement of said ratchet lock assembly on said support sleeve assembly;

i. cross link means disposed in said cross link assembly and connecting said cross link mandrel to said ratchet lock assembly for transmitting "pull" force to said retrieving grapple assembly via said ratchet lock assembly;

j. torque link means disposed in said tension mandrel assembly and engageable with said support sleeve assembly slot means for transmitting torqueing force from said tension mandrel assembly to said support sleeve assembly;

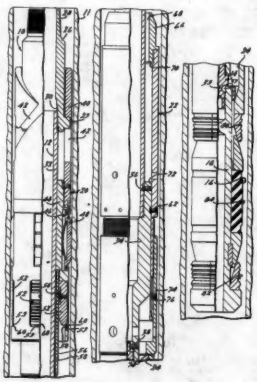
k. said retrieving grapple assembly including grapple means adapted for engaging the retrieving neck of the packer to be retrieved and also adapted for torqueing engagement with said means connecting said retrieving grapple assembly to said ratchet lock assembly so as to provide for disengagement of said grapple means from said retrieving neck by application of torqueing force to said grapple means.

4,572,290

MECHANICAL SETTING TOOL

Ted G. Clifton, Tulsa, Okla., assignor to Arrow Oil Tools Inc., Tulsa, Okla.

Filed Feb. 6, 1984, Ser. No. 577,144
Int. Cl.[4] E21B *23/06, 23/00*
U.S. Cl. 166—123 **10 Claims**



10. A retrievable mechanical setting tool for setting downhole tools in a casing, said setting tool comprising:

an inner mandrel having a bottom end connectable to an inner component of said downhole tool;

an outer upper tubular member surrounding said inner mandrel and axially slideable thereon;

an outer lower tubular member surrounding said inner mandrel and releasably fixed thereto, said outer lower tubular member aubuttable against an outer component of said downhole tool;

setting means for affixing said outer members with respect to said casing against upward movement, such that upon further upward movement of said inner mandrel, said inner mandrel becomes released from said outer lower tubular member and moves upward relative to said outer

lower tubular member causing said outer component to move relative to said inner component of said downhole tool with such relative movement causing said downhole tool to set and affix against said casing;

release means for releasing said inner mandrel from said inner component;

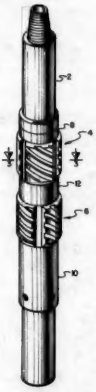
disengagement means for disengaging said setting means from said casing upon a predetermined upward movement of said inner mandrel with respect to said outer upper tubular member whereby said mechanical setting tool can be retrieved from said casing.

4,572,291

WELL CASING SCRAPER

Robert E. Robison, 4619 Vanderbilt Ct., Ventura, Calif. 93003

Filed Nov. 6, 1984, Ser. No. 668,708
Int. Cl.[4] E21B *37/02*
U.S. Cl. 166—173 **10 Claims**



1. In a well casing scraper having an elongate body adapted to be lowered into a well casing and a plurality of scraper blades mounted on the body for cleaning the interior of the casing when the body is rotated, the improvement comprising:

a plurality of splines spaced around the circumference of the body and extending longitudinally along a portion thereof,

each of the scraper blades being provided with means for engaging respective splines to enable the blades to be slid along the splines to desired positions, said engaging means retaining the blades on the splines against outward movement away from the body, said splines including a loading area for receiving the blades, and

means for restraining the blades from longitudinal movement on the splines after the blades have been slid to a cutting position, said means restraining the blades from longitudinal movement comprising a blade stop means spaced from the loading area and to one side thereof, an annular threading around the body on the other side of the loading area, and a retainer ring having first and second spaced sets of interior threading with a gap between the two sets which is wider than the longitudinal extent of the annular threading, the ring being adapted to be screwed over the annular threading to a blade retaining position with the first set of threading extending beyond the annular threading towards the blades and the second set of threading engaging the annular threading, the relative dimensions of the ring, blades, annular threading and spline loading area being selected so that, if the ring becomes unscrewed to the extent that the annular threading is within the gap between the two sets of ring threading, the blades are still retained on the splines by the ring.

4,572,292

ENHANCED OIL RECOVERY

Paul R. Stapp, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Apr. 4, 1984, Ser. No. 596,869
Int. Cl.[4] E21B *43/16*
U.S. Cl. 166—274 **6 Claims**

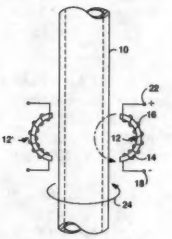
1. A method for recovering fluid hydrocarbons from a subterranean oil-bearing formation which is penetrated by a well and at least one production well which comprises injecting into said formation through said injection well an aqueous solution consisting essentially of water, an inorganic peroxide, and at least one fatty amine oxide, thereafter injecting into the formation an aqueous drive fluid, and producing oil from said formation through said production well.

4,572,293

METHOD OF PLACING MAGNETIC MARKERS ON COLLARLESS CASED WELLBORES

James G. Wilson, Hobbs, N. Mex., and Gerald J. Crawford, Tulsa, Okla., assignors to Standard Oil Company (now Amoco Corporation), Chicago, Ill.

Filed Aug. 31, 1984, Ser. No. 646,617
Int. Cl.[4] E21B *47/09*
U.S. Cl. 166—250 **5 Claims**



1. A method of marking a wellbore casing in a manner such that the mark can be subsequently detected by a casing collar locator comprising placing a horseshoe-shaped electromagnet adjacent said casing and energizing said electromagnet producing a magnetic marker at a location between the poles of the electromagnet.

4,572,294

NON-CONDENSIBLE GAS INJECTION INCLUDING ALPHA-OLEFIN SULFONATE SURFACTANT ADDITIVES

John H. Duerksen, Fullerton; Robert G. Wall, Pinole, and Jack D. Knight, Berkeley, all of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Continuation-in-part of Ser. No. 507,834, Jun. 24, 1983, abandoned. This application May 16, 1984, Ser. No. 610,556
Int. Cl.[4] E21B *43/22*
U.S. Cl. 166—273 **23 Claims**

1. A non-condensible gas process of recovering hydrocarbons from a subterranean formation in the absence of steam, wherein said formation is penetrated by at least one injection well and at least one production well, said process sequentially comprising:

(a) injecting a non-condensible gas at an injection well until non-condensible gas breakthrough occurs at a production well;

(b) continuing to inject into said formation said non-condensible gas and, including therewith and under non-steam conditions, a sufficient amount of alpha-olefin sulfonate to form a non-condensible gas and alpha-olefin sulfonate foam to assist the movement of hydrocarbons toward said production well; and

(c) recovering hydrocarbons from said production well.

4,572,295

METHOD OF SELECTIVE REDUCTION OF THE WATER PERMEABILITY OF SUBTERRANEAN FORMATIONS

David Walley, Stillwater, Okla., assignor to Exotek, Inc., Stillwater, Okla.

Filed Aug. 13, 1984, Ser. No. 639,860
Int. Cl.[4] E21B *33/138*
U.S. Cl. 166—295 **18 Claims**

1. A method of selectively reducing the water permeability of a subterranean formation comprising:

introducing a non-aqueous treatment agent, comprising a cross-liked hydrogel polymer, into the formation, the hydrogel polymer comprising:

a first particle fraction comprising: particles having an average diameter less than the average pore diameter of the treated formation and greater than about ⅓ of the average pore diameter of the treated formation; and

a second particle fraction comprising: particles having an average diameter of between about one and about two orders of magnitude greater than the average pore diameter of the treated formation; and

maintaining the treatment agent within the formation for a time sufficient to permit the hydrogel polymer to absorb water from the formation.

4,572,296

STEAM INJECTION METHOD

David R. Watkins, Irvine, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Filed Sep. 20, 1984, Ser. No. 653,027
Int. Cl.[4] E21B *43/24*
U.S. Cl. 166—303 **30 Claims**

1. A method for injecting steam into a subterranean reservoir via a well penetrating the reservoir, comprising adding to steam generator feedwater used to generate the steam, or adding to the steam, or adding to both the feedwater and the steam, a mixture comprising:

(a) a compound selected from the group consisting of ammonium salts of inorganic acids, ammonium salts of carboxylic acids, quaternary ammonium halides, amine or substituted amine hydrochlorides, and mixtures thereof; and

(b) a compound selected from the group consisting of ammonia, salts which decompose to form acid neutralizers or buffers having alkaline pH values, amides of carbamic acid or thiocarbamic acid and derivatives of such amides, tertiary carboxylic acid amides and their substituted and alkylated derivatives, and mixtures thereof.

4,572,297

METHOD OF FORMATION PERMEABILITY TREATMENT WITH ALKALI METAL HYDROXIDE

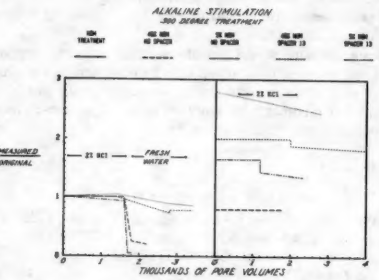
Arnold B. Thigpen, Jr., Houston; Mark D. Looney, Missouri City, and Philip D. Fader, Katy, all of Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Jul. 6, 1984, Ser. No. 628,548
Int. Cl.[4] E21B *43/27*
U.S. Cl. 166—307 **18 Claims**

1. A method for improving the permeability of an underground hydrocarbon reservoir containing clays and other fine particles where damage has occurred or may occur, comprising:

injecting an aqueous buffer solution into the hydrocarbon reservoir through a well, said buffer solution having a pH greater than about 12 and comprising about 0.5% to about 5% by weight of an alkali metal hydroxide and about 0.5% to about 5% by weight of an alkali metal salt; and

injecting an aqueous treating solution into the hydrocarbon reservoir after the buffer solution, said treating solution having a pH greater than about 12 and comprising about 2% to about 25% by weight of an alkali metal hydroxide;



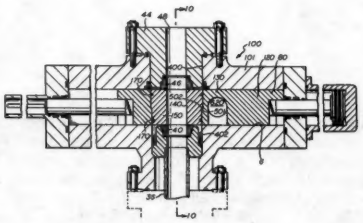
maintaining contact between the treating solution and the portion of the reservoir desired to be treated for a time of about thirty minutes to about 24 hours.

4,572,298

GATE VALVE APPARATUS AND METHOD

Harry Weston, Warnam, United Kingdom, assignor to Hydril Company, Los Angeles, Calif.

Filed Nov. 4, 1983, Ser. No. 549,255
Claims priority, application United Kingdom, Nov. 5, 1982, 8231601; Nov. 11, 1982, 8232226; Dec. 20, 1982, 8236158; May 20, 1983, 8313970
Int. Cl.[4] E21B *34/02*
U.S. Cl. 166—379 **44 Claims**



1. A valve comprising,

a housing having a vertical housing passage and a lateral housing passage, said vertical and lateral passages intersecting each other,

a laterally movable gate disposed in said lateral passage, said gate having

a first lateral portion with a first gate vertical passage having a diameter substantially the same as or less than the vertical housing passage,

a second lateral portion having no vertical passage therethrough, and

a third lateral portion with a second gate vertical passage having a diameter smaller than said first gate vertical passage,

means for laterally moving said gate in said lateral housing passage between at least two positions:

the first position where said gate is in a lateral position such that said first gate vertical passage is aligned with said vertical housing passage and full diameter access through the vertical housing and the first gate vertical passage is provided, and

the second position where said gate is in a second lateral position such that said second lateral portion of said gate is aligned with said vertical housing passage and the verti-

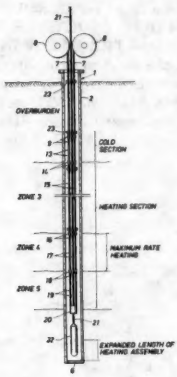
cal flow path through the vertical housing passage is closed.

4,572,299

HEATER CABLE INSTALLATION

Cor F. Vanegmond, and Peter Van Meurs, both of Houston, Tex., assignors to Shell Oil Company, Houston, Tex.

Filed Oct. 30, 1984, Ser. No. 666,528
Int. Cl.[4] E21B *36/04*
U.S. Cl. 166—385 10 Claims



1. A process for installing an electrical heater within a well comprising:

spooling and arranging electrical cables to provide at least one spooling means drum containing at least one power supply cable with an innermost end arranged for subsequent connection to a surface located electrical power source and an outermost end connected to one or a series of end-to-end connected metal-sheathed heat-stable power transmitting cables which in turn are spliced to a metal-sheathed temperature stable heating cable having its outermost end connected to, or adapted to be connected to, at least one other heating cable or other circuit-completing electrical conductor;

spooling a relatively flexible strand which is heat and tension stable and is capable of supporting the weight of said cables within a well at the temperature provided by said heating cables with the strand being arranged with an innermost end capable of being suspended within a wellhead and an outermost end capable of being attached to a weight for pulling the strand into the well;

correlating the dimensions and properties of said cables and strands so that the power supply cables, power transmission cables, heater cables and strand have lengths arranged for (a) extending from a surface location to, respectively, the depths selected for the top of the power transmission cables and the heater cables and bottom ends of the heater cables and weight supporting strand and (b) having electrical resistances within the cables such that, while conducting the current required for generating the temperature to which the interval of earth formations is to be heated, relatively insignificant amounts of heating occurs above the interval to be heated; and

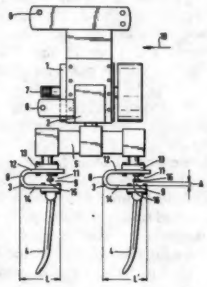
concurrently unspooling said cables and weight supporting strand into the well while attaching the weighting means to the outermost end of the strand, interconnecting the heater cables and attaching all of the cables to at least portions of the strand before those items are lowered into the well.

4,572,300

VIBRATING HARROW

Reinhard Higgen, Eichenweg, Fed. Rep. of Germany, assignor to Amazonen Werke H. Dreyer GmbH & Co KG, Hasbergen-Gaste, Fed. Rep. of Germany

Filed Nov. 8, 1984, Ser. No. 669,814
Claims priority, application Fed. Rep. of Germany, Nov. 11, 1983, 3340821
Int. Cl.[4] A01B *19/06*
U.S. Cl. 172—54.5 15 Claims



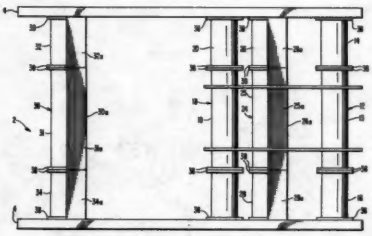
1. In a vibrating harrow with a supporting frame having at least two beams positioned one behind another and which extend across the direction of travel with soil-cultivation tines depending therefrom and means are mounting the beams on the supporting frame including rockers for moving the beams back and forth across the direction of travel during operation through the intermediary of a drive mechanism by the power source of a tractor or cultivator, the improvement wherein beams are longitudinal beams with a U-shaped cross-section, wherein the open side of each longitudinal beam faces away from the direction of travel, wherein the rockers are mounted on the upper flank of the beams, and the tines are mounted on the lower flank of the beams, and wherein the beams are open at the rear over approximately their total length.

4,572,301

ADJUSTABLE SPREADER-GRADER

Leverence Bourgeois, Jr., Metairie, La., assignor to Ivy J. Foret Associates, Inc., Metarie, La.

Filed Jan. 18, 1984, Ser. No. 571,703
Int. Cl.[4] E01C *19/22*
U.S. Cl. 172—445.1 11 Claims



1. An adjustable spreader-grader apparatus comprising:

two spaced side plates each having lower plate edges adapted to ride on the media to be graded,

a forward blade carrier means positioned laterally between said side plates,

a forward blade secured to said forward blade carrier means,

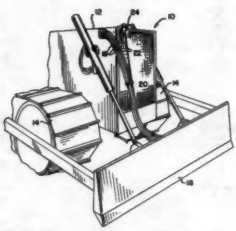
said forward blade carrier means having opposite lateral first and second forward ends,
a removable foward blade carrier insert having lateral first and second insert ends,
a forward insert blade secured to said forward blade carrier insert,
said forward blade and said forward insert blade generally forming a continuous generally transverse ground media grading blade when said forward blade carrier insert is connected between said side plates, which grading blade is longer than said foward blade alone,
a first forward connecting means for removably connecting said first insert end to said first forward end,
a second foward connecting means for removably connecting said second insert end to one said side plate,
a rear blade carrier means positioned laterally between said side plates,
a rear blade secured to said rear blade carrier means,
said rear blade carrier means having opposite lateral first and second rear ends,
a removable rear blade carrier insert having lateral first and second rear insert ends,
a rear insert blade secured to said rear blade carrier insert,
said rear blade and said rear insert blade generally forming a continuous generally transverse ground media grading blade when said rear blade carrier insert is connected between said side plates, which grading blade is longer than said rear blade alone,
a first rear connecting means for removably connecting said first rear insert end to said first rear end,
a second rear connecting means for removably connecting said second rear insert end to said one said side plate,
a bracing means extending laterally between said side plates,
said bracing means having opposite lateral first and second bracing ends,
a removable bracing insert having opposite lateral first and second bracing insert ends,
a first bracing connecting means for removably connecting said first bracing end to said first bracing insert end,
a second bracing connecting means for removably connecting said second bracing insert end to said one said side plate,
a connecting means for connecting said second forward end, said second rear end, and said second bracing end to the other said side plate, and
a hitching means connected to said bracing means for hitching said apparatus to a tractor.

4,572,302

HOSE CLAMP ASSEMBLY WITH CABLE SUPPORT

Claude M. Frisbee, Bettendorf, Iowa, assignor to J. I. Case Company, Racine, Wis.

Filed Jun. 4, 1984, Ser. No. 616,914
Int. Cl.⁴ B05B *15/06*
U.S. Cl. 172—813 **9 Claims**



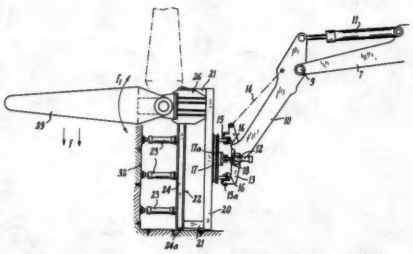
1. A clamp assembly for a material handling device having a body, a movable implement attached thereto, and at least one fluid hose extending therebetween, comprising:
flexible linkage means extending between said material handling device body and said movable implement with opposite ends of said flexible linkage means respectively connected to said body and to said movable implement; and
clamp means for holding said fluid hose in substantially fixed relation to said clamp means, said clamp means receiving said flexible linkage means therethrough such that said clamp means is freely movable with respect to said flexible linkage means attendant to movement of said implement whereby said clamp means supports said fluid hose.

4,572,303

MACHINE FOR EXTRACTING, ROUGH SHAPING AND SQUARING BLOCKS OF STONES, MARBLES AND GRANITES, PARTICULARLY IN QUARRIES

Roger Marechal, Nuits sur Armancon, France, assignor to Rocamat, Puteaux, France

Filed Jul. 11, 1983, Ser. No. 512,543
Claims priority, application France, Jul. 21, 1982, 82 12722
Int. Cl.⁴ E21B *15/04*
U.S. Cl. 173—39 **6 Claims**



1. A rock cutting machine, comprising:
an automotive vehicle;
a pivotable boom mounted for pivotal movement on said vehicle;
a beam pivotally mounted on said boom and carrying a swingle bar at the end of said beam remote from said boom;
said swingle bar being pivotally mounted on said beam at about the center of said swingle bar, said swingle bar being in the form of a yoke having arms, each arm carrying coupling means;
a rotatable plate coupled to said swingle bar through said coupling means;
a first frame affixed to said rotatable plate;
a second frame spaced from said first frame, and fixed to said first frame by cross beams, said second frame having longitudinal side members of square cross section oriented as guide members, with the closest portions of said side members to each other being edges;
a sawing unit comprising a cutting chain, a motor connected to and adapted to drive said cutting chain, a base supporting both said cutting chain and said motor, and guide wheels journaled in said base for engagement with said guide members, the wheels, base, and associated cutting chain being moveable along said guide members;
means mountable on said vehicle for maintaining the vehicle in a fixed position on the ground;
adjusting means for adjusting the respective position of said boom, beam, swingle bar, rotary plate and sawing unit; and
means for maintaining the second frame in a fixed position during a cutting operation, said frame maintaining means being:
bearing means provided on one end of said guide member and adapted to engage horizontal ground; and

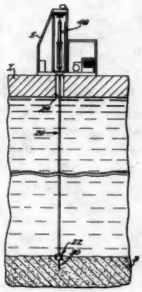
bearing means provided on the side of the second frame remote from the rotatable plate, and adapted for engaging a vertical wall of rock, whereby the frame is maintainable in a fixed position under pressure between the fixable automobile vehicle, the ground, and vertical wall.

4,572,304

PORTABLE SEABED PENETRATION SYSTEM

Larry J. Mahar, and Bruce J. Douglas, both of Long Beach, Calif., assignors to The Earth Technology Corporation, Long Beach, Calif.

Filed Jul. 23, 1984, Ser. No. 633,407
Int. Cl.[4] E21B *19/08;* B63B *21/27*
U.S. Cl. 175—5 7 Claims



1. A seabed penetration system, comprising:
a support disposed over the portion of the seabed to be penetrated;
a casing string depending from said support;
a suction anchor secured to the lower end of said casing string;
a push rod string slideably extending from said support through said casing string to the seabed;
a seabed penetration member on the lower end of said push rod string;
pump means in communication with the interior of said suction anchor to evacuate the latter and thereby temporarily anchor said casing string to the seabed; and
means on said support connected to the upper ends of said casing string and said push rod string to concurrently tension said casing string and urge said push rod string downwardly to thereby effect penetration of the seabed by said seabed penetrating member, with said push rod string being restrained against buckling by said casing string.

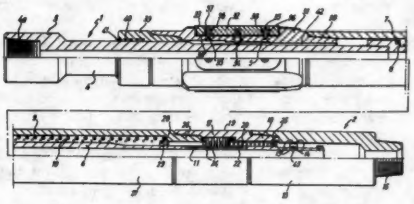
6. A method of penetrating the seabed below a body of water with a seabed penetrating member, said method including the steps of:
lowering a suction anchor through the water to the upper surface of the seabed on a casing;
inserting a push rod string that carries the seabed penetrating member downwardly through said casing until the penetrating member is adjacent the seabed;
evacuating the suction anchor to temporarily secure the lower end of the casing string to the seabed; and
tensioning the casing string while forcing the push rod string downwardly to embed the penetrating member in the seabed to thereby prevent buckling of the push rod string.

4,572,305

DRILLING APPARATUS

George Swietlik, Sandings, Broad View Rd., Oulton Broad, Lowestoft, Suffolk, Great Britain

Filed Feb. 27, 1984, Ser. No. 583,947
Claims priority, application United Kingdom, Jan. 27, 1983, 8302270
Int. Cl.[4] E21B *7/10, 17/10*
U.S. Cl. 175—325 5 Claims



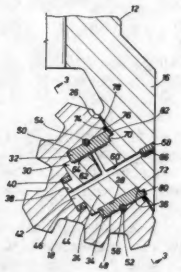
1. A telescopically-expandible tubular stabiliser for use in directional drilling comprising
upper and lower connection means for connecting the stabiliser into a drill string
an elongate fluid-conducting body having one of said upper and lower connection means
an elongate fluid-conducting mandrel telescopically slidable within the body and splined to the body, the mandrel having the other of said upper and lower connection means, the mandrel being spring-urged out of the body
means defining apertures in a side wall of the body and spaced around the body
radially-movable bearing members, a portion of said bearing members disposed in said apertures
spring means uging said bearing members into the body
cam means on the mandrel in engagement with said portion of said bearing members to move the bearing members radially outwardly of the body against the action of said spring means on telescopic withdrawal of the mandrel from the body in response to a reduction in the magnitude of a force applied to it in the intended drilling direction.

4,572,306

JOURNAL BUSHING DRILL BIT CONSTRUCTION

Dennis D. E. Dorosz, 524 Culduthel Rd., Victoria, B.C., Canada (U8X 1G1)

Filed Dec. 7, 1984, Ser. No. 679,547
The portion of the term of this patent subsequent to Oct. 23, 2001, has been disclaimed.
Int. Cl.[4] E21B *10/22*
U.S. Cl. 175—371 14 Claims



1. A rotary earth boring bit, comprising:
(a) a body structure adapted for threaded connection to a

string of drill stem, said body structure defining a plurality of cutter support legs, each forming planar surface means;

(b) journal means extending transversely from each of said cutter support legs and being oriented in normal relation with said planar surface means, said journal means defining bushing retainer means and reduced diameter bearing surface means of smaller dimension than said bushing retainer means;

(c) rotary cone cutter means defining external cutter teeth and forming an internal journal and bushing receptacle, said rotary cutter means forming planar cutter surface means;

(d) segmented bushing means being positioned about said bearing surface means and being received in mechanically seized relation within said journal and bushing receptacle, end portions of said segmented bushing means extending beyond said planar cutter surface means for engagement with said planar surface means of said cutter support legs and maintaining said planar cutter surface means in spaced relation with said planar surface means of said cutter support legs, said segmented bushing means and said rotary cone cutter means cooperatively forming a circular seal recess intersecting said planar cutter surface means;

(e) locking means being positioned about said segmented bushing means within said journal and bushing receptacle and securing said rotary cutter means in locked assembly with said segmented bushing means, whereby said rotary cutter means and said segmented bushing means are rotatably mounted on said journal means; and

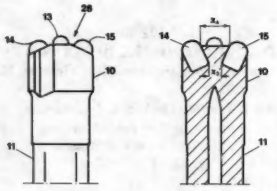
(f) circular seal means disposed within said circular seal recess and being positioned about said segmented bushing means and establishing a seal with said planar surface means of said cutter support legs and with said segmented bushing means.

4,572,307

ROCK DRILL

Lars-Erik Tunell, Sandviken, Sweden, assignor to Santrade Limited, Luzerne, Switzerland

Filed Mar. 21, 1984, Ser. No. 591,783
Claims priority, application Sweden, Apr. 5, 1983, 8301860
Int. Cl.[4] E21B *10/56*
U.S. Cl. 175—410 **7 Claims**



1. A rock drill for percussion drilling of small diameter holes, comprising:

a bit body including a front face,

frontal button inserts, consisting of two in number and formed of hard metal, are mounted in said bit body and projecting forwardly beyond said front surface, and

gauge button inserts, consisting of two in number and formed of hard metal, are mounted in gauge bores in said bit body and projecting forwardly beyond said front face, said gauge bores and said gauge button inserts being inclined at an angle relative to a longitudinal axis of the rock drill as viewed in a radial direction such that said gauge bores approach one another rearwardly, said gauge button inserts being arranged to define the diameter of the hole drilled by the rock drill,

said frontal button inserts spaced radially inwardly of the diameter of the hole being drilled,

the distance between said frontal button inserts being larger than the difference between the radial extension of said front face and the radial extension of said frontal button inserts, respectively,

the smallest distance between the radially innermost portions of said gauge bores being smaller than said distance between said frontal button inserts,

the smallest distance between the longitudinally outermost portions of said gauge bores being larger than said distance between said frontal button inserts,

said frontal button inserts arranged on planar surface portions of said front face, said planar surface portions being coplanar,

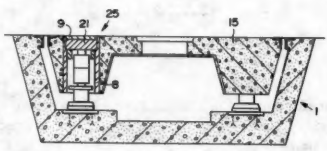
said gauge button inserts arranged on first and second surface portions, respectively, of said front face in such a way that a first imaginary line interconnecting the centers of the gauge button inserts is perpendicular to a second imaginary line interconnecting the centers of the frontal button inserts, said first and second surface portions being inclined relative to said planar surface portions, and said first and second imaginary lines intersecting each other at their middle points.

4,572,308

METHOD FOR CONSTRUCTING A WEIGHBRIDGE AND WEIGHING CELL ASSEMBLY, IN PARTICULAR FOR USE IN PERFORMING THE METHOD

Peter Giesecke, Seeheim/Stettbach, and Johann Feith, Roedermark, both of Fed. Rep. of Germany, assignors to Firma Carl Schenck AG, Darmstadt, Fed. Rep. of Germany

Filed May 7, 1984, Ser. No. 607,941
Int. Cl.[4] G01G *19/02*
U.S. Cl. 177—1 **7 Claims**



1. A method for constructing a weighbridge, wherein the weighing platform is made of reinforced concrete and is built in a previously prepared foundation ditch for the bridge, and wherein the connecting or bearing elements for the weighing cells are cast into the weighing platform, comprising the following steps: using said foundation ditch (1) as a mold for casting said weighing platform (15), after the hardening of the foundation ditch (1) placing separating means (10, 11) into said foundation ditch for separating said weighing platform (15) from the foundation ditch (1), and then casting said weighing platform (15) in the foundation ditch (1).

4,572,309

LOAD CELL TYPE WEIGHT-MEASURING DEVICE

Yoshihisa Nishiyama, Shizuoka, Japan, assignor to Tokyo Electric Co., Ltd., Tokyo, Japan

Filed Nov. 5, 1984, Ser. No. 668,263
Claims priority, application Japan, Nov. 15, 1983, 58-214409; Nov. 15, 1983, 58-214410
Int. Cl.[4] G01G *19/52, 23/14, 3/14;* G01L *1/22*
U.S. Cl. 177—50 **11 Claims**

1. A load cell type weight-measuring device comprising:

a load cell which generates an output voltage responsive to a weight which is applied thereto;

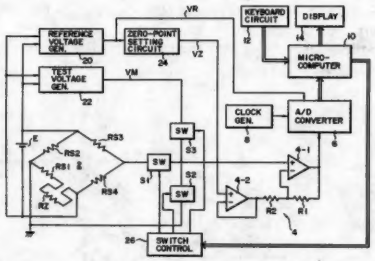
test voltage generating means for generating an output voltage equal to an output voltage which is generated from said load cell when a rated weight is applied thereto;

zero-point setting means;

first amplifying means of a gain 1 for amplifying an output voltage from said zero-point setting means;

first and second resistor means;

second amplifying means having first and second input terminals, said first input terminal being connected to an output terminal of said first amplifying means through said first resistor means and also connected to an output terminal thereof through said second resistor means;



switching means for selectively coupling one of output terminals of said load cell and test voltage generating means to said second input terminal of said second amplifying means;

analog-digital converting means for converting an output voltage from said second amplifying means to digital data; and

data processing means for processing output data from said analog-digital converting means and generating weight data.

4,572,310

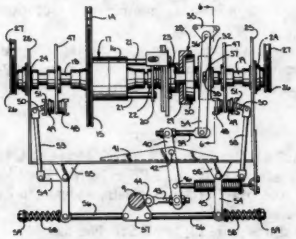
DRIVE SYSTEM FOR A VEHICLE

Timothy J. Peter, Waukesha, Wis., assignor to Ransomes, Inc., Johnson Creek, Wis.

Filed Jul. 30, 1984, Ser. No. 635,570

Int. Cl.[4] B62D *11/00*

U.S. Cl. 180—6.24 **11 Claims**



11. A drive system for a vehicle, comprising a chassis, drive means mounted on the chassis and having an output shaft, a differential having an input member and a pair of output members, connecting means for connecting the output shaft to the input member of the differential, a pair of drive wheels, each of said drive wheels being connected to one of said output members, clutch means interconnecting said input member and one of said output members, said clutch means having an engaged position for operably connecting said input member to said one output member whereby both output members will rotate at the same speed, said clutch means having a disengaged position wherein said output members can rotate independently, a steerable wheel mounted on the chassis, a steering column mounted for rotation on the chassis and operably connected to the steerable wheel whereby rotation of said column will pivot said steerable wheel to turn said vehicle, means for moving said clutch means to the engaged position when said steerable wheel is in a straight ahead position, means responsive to the steering column being rotated beyond a first arc on either side of said straight ahead position for disengaging said clutch means, brake means operably connected to each drive wheel, and means responsive to rotation of said steering column in a first direction beyond a second arc substantially greater than said first arc to operate said brake means associated with one of said drive wheels, said drive means having a high speed forward position, and means responsive to rotation of said steering column to either side of said straight ahead position when said drive means is in said high speed forward position for reducing the speed of said drive means.

4,572,311

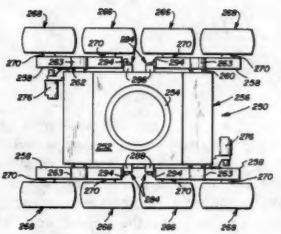
WALKING BEAM ARRANGEMENT FOR ADVERSE TERRAIN VEHICLE

Norman D. Oswald, 1406 Braewood Pl., Duncanville, Tex. 75116, and Harry S. Mankey, 12107 Snow White Dr., Dallas, Tex. 75234

Continuation of Ser. No. 409,821, Aug. 20, 1982, abandoned, and a continuation-in-part of Ser. No. 375,973, May 7, 1982, Pat. No. 4,407,381, which is a continuation of Ser. No. 115,942, Jan. 28, 1980, abandoned, which is a continuation-in-part of Ser. No. 11,857, Feb. 13, 1979, Pat. No. 4,210,218, which is a continuation of Ser. No. 799,328, May 23, 1977, abandoned. This application Jan. 25, 1985, Ser. No. 695,405

Int. Cl.[4] B62D *11/02*

U.S. Cl. 180—6.48 **4 Claims**



1. An undercarriage assembly for supporting and propelling a mechanism, comprising:

a main frame for connection to the mechanism;

side frames pivotally mounted adjacent the fore and aft ends of said main frame on either side of said main frame;

an inner and an outer axle member, each axle member being rotatably supported at longitudinally spaced points along each of said side frames and on opposite sides of the pivotal axis of said side frames, each of said axle members having a wheel receiving member at one end thereof;

at least one wheel member mounted on and secured to the wheel receiving member of each of said axle members;

transmission means positioned within each of said side frames for drivingly interconnecting said axle members, and transmission means including a plurality of sprockets each mounted on one of the axle members within said side frame and chain means constrained about said sprockets;

a plurality of drive means each mounted on and individual to the exterior of one of the side frames and operably connected to the transmission means thereof whereby said drive means and said transmission means cause concurrent rotation of the interconnected axle members, each of aid exteriorly mounted drive means comprising:

a speed reducer with an output shaft operably connected to the transmission means within said corresponding side frame;

a motor operably oonnected to said speed reducer; and

a brake operably interposed between said motor and said speed reducer;

at least one double-acting fluid cylinder interconnecting said main frame and each of said side frames adjacent the inner axle member of each of said side frames for pivoting said side frames, wherein each fluid cylinder is substantially vertically mounted between said main frame and a point adjacent the inner axle member of the corresponding side frame; and

pump means for providing pressurized fluid to each chamber of said fluid cylinders.

4,572,312

MECHANISM FOR ENABLING A VEHICLE BONNET TO BE OPENED AND CLOSED

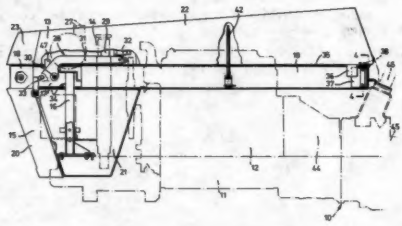
Michael France, and Rodney Booth, both of Huddersfield, England, assignors to Case Poclain Corporation Ltd., Huddersfield, England

Filed Aug. 20, 1982, Ser. No. 410,169

Claims priority, application United Kingdom, Aug. 27, 1981, 8126137; Feb. 5, 1982, 8203434

Int. Cl.[4] B62D *25/10*

U.S. Cl. 180—69.21 **2 Claims**



1. Mechanism for enabling a vehicle bonnet to be opened and closed comprising two laterally-spaced bell-crank levers pivotable about a common axis disposed transversely on the vehicle's frame near the front end thereof, two side waist-rails secured to the frame, two members projecting downwardly from the respective sides of the bonnet near the rear end thereof, one arm of each lever extending rearwardly when the bonnet is closed and being pivotably connected to the adjacent side of the bonnet, and the other arm of each lever being arranged to abut against a stop on the frame when the bonnet has been initially moved forwardly by simultaneously pivoting the bonnet relative to the lever and the lever relative to the frame, whereafter the rear end of the bonnet is secondarily moved upwardly and forwardly into opened position by pivoting the bonnet relative to the stationary lever, the bonnet being closed by performing the same movements in reverse sequence, and an arch member secured between the side waist-rails to guide the bonnet near the end of its initial closing movement so as to ensure that the members projecting downwardly from the bonnet engage the inner surfaces of the respective side waist-rails and thus locate the rear end of the bonnet laterally.

4,572,313

RELAY ARRANGEMENT FOR STEERING WHEEL

Satoshi Ono; Hiroshi Sugita, and Tetsushi Hiramitsu, all of Aichi, Japan, assignors to Toyoda Gosei Co., Ltd., Aichi, Japan

Filed Jul. 9, 1984, Ser. No. 629,175

Claims priority, application Japan, Sep. 9, 1983, 58-125286

Int. Cl.[4] B60K *23/00*

U.S. Cl. 180—78 **6 Claims**

1. A relay arrangement for a steering wheel, the arrangement comprising:

(a) a stationary column;

(b) a steering shaft rotatably supported in said stationary column;

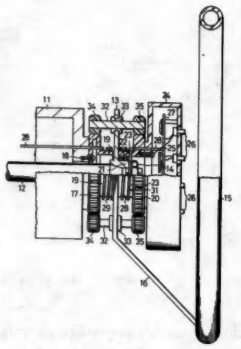
(c) a boss plate attached to said steering shaft;

(d) a steering ring supported by at least one spoke on said boss plate;

(e) a pair of first and second sun gears disposed axially one on each side of said boss plate, respectively, said second sun gear being fixed to said stationary column;

(f) a pad attached to said first sun gear remotely from said boss plate and supporting at least one switch for controlling electric accessories;

(g) at least one planet gear shaft rotatably supported on said boss plate;



(h) at least a pair of first and second planet gears mounted on ends of said planet gear shaft and held in mesh with said first and second sun gears, respectively, whereby said pad can be kept stationary during rotation of said steering ring and shaft;

(i) a cable for transmitting signals from said switch to the electric accessories, said cable having a spiral winding through which said boss plate extends;

(j) the winding being disposed between said first and second sun gears, the number of turns of the winding being in excess of the maximum number of revolutions that the steering wheel can make;

(k) the boss plate being constructed and arranged to slide between two neighboring turns of the winding, for pushing the cable towards the steering column and the pad.

4,572,314

ELECTRICAL POWER STEERING MECHANISM OF THE RACK AND PINION TYPE FOR MOTOR VEHICLES

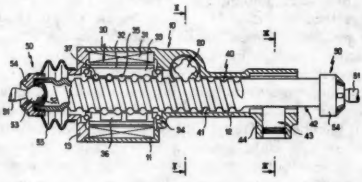
Narciso M. Anguera, Barcelona, Spain, assignor to Bendiberica, S.A., Barcelona, Spain

Filed Apr. 23, 1984, Ser. No. 602,835

Claims priority, application Spain, Apr. 28, 1983, 522.273

Int. Cl.[4] B62D *5/04*

U.S. Cl. 180—79.1 **8 Claims**



1. An electrical power steering mechanism for a vehicle, comprising an axially reciprocable driven rack structure, a

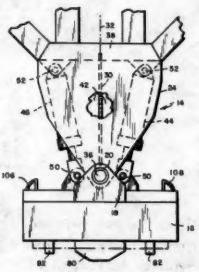
rotary electric motor having an output member operatively connected with peripheral helical grooves formed on a cylindrical portion of said rack structure via a ball drive connection between said output member and said grooves for driving said rack structure, a rotatable pinion gear coupled to a manual input member and in meshing engagement with said grooves for driving said rack structure, and sensing means responsive to actuation of said input member for actuating said electric motor.

4,572,315

POWER HITCH

Ronald L. Caron, Auburn, Me., assignor to Valley Engineering, Inc., Gray, Me.

Filed Feb. 9, 1984, Ser. No. 578,754
Int. Cl.[4] B62D *5/06*
U.S. Cl. 180—134 **9 Claims**



1. A power hitch for pivotally manipulating an implement being towed behind a vehicle, said power hitch comprising:

a first frame element having means thereon for defining a vertical pivot axis, said first frame element being adapted for connection to the vehicle with said pivot axis located to the rear of the vehicle;

a second frame element adapted for connection to the implement, said second frame element having vertically spaced upper and lower plates interconnected in part by a rib lying on a central axis, with side plates cooperating with said rib and said upper and lower plates to define compartments, and with openings in said side plates communicating with said compartments;

means on the central axis of said second frame element for connecting said second frame element to said first frame element for pivotal movement about said pivot axis;

a pair of extensible actuators located in said compartments on opposite sides of said central axis, said actuators being arranged to extend through the openings in said side plates and being pivotally connected at opposite ends respectively to said first and second frame elements; and

control means for extending either one of said actuators while simultaneously retracting the other of said actuators in order to pivot said second frame element and the implement connected thereto about said pivot axis.

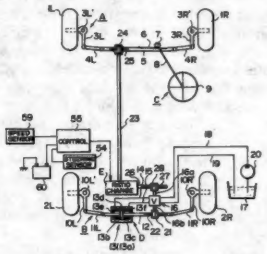
4,572,316

FOUR-WHEEL STEERING SYSTEM FOR VEHICLE

Hirotaka Kanazawa; Takatani Teruhiko; Furutani Shigeki, all of Hiroshima; Isamu Chikuma, Gumma; Satoru Shimada, Gumma, and Hiroshi Eda, Gumma, all of Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Filed Mar. 8, 1985, Ser. No. 709,723
Claims priority, application Japan, Mar. 15, 1984, 59-48053; Mar. 15, 1984, 59-48054
Int. Cl.[4] B62D *5/06*
U.S. Cl. 180—143 **17 Claims**

1. A four-wheel steering system for a vehicle comprising a steering mechanism including a steering wheel, a front wheel turning mechanism operatively connected to the steering mechanism to turn the front wheels according to the turning angle of the steering wheel, a rear wheel turning mechanism operatively connected to the steering mechanism to turn the rear wheels in response to operation of the steering wheel, and a rear wheel steering ratio changing mechanism for changing the ratio of the turning angle of the rear wheels with respect to the turning angle of the steering wheel, characterized in that said rear wheel steering ratio changing mechanism comprises a pivoted member which is adapted to be swung by a swinging member, the swinging plane of the pivoted member along which the pivoted member is swingable being adapted to be inclined with respect to a predetermined reference plane, the swinging member being adapted to swing the pivoted member



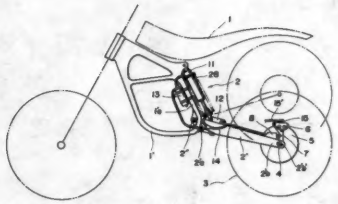
by way of steering operating force from said steering wheel; inclination changing means for changing the angle of inclination of the pivoted member with respect to the reference plane; and connecting means which connects an off-centered portion of the pivoted member positioned separated from the pivotal center of the pivoted member with said rear wheel turning mechanism, whereby the turning angle of the rear wheels is controlled according to the amount of movement of the off-centered portion of the pivoted member which is determined by the swinging angle of the pivoted member through which the pivoted member is swung by the swinging member in response to operation of the steering wheel and by the angle of inclination of the pivoted member with respect to the reference plane.

4,572,317

POSITION CONTROL SYSTEM FOR THE BODY OF A VEHICLE

Tokio Isono, Tokyo, and Shoji Tachikawa, Saitama, both of Japan, assignors to Honda Giken Kogyo K.K., Tokyo, Japan

Filed Oct. 28, 1983, Ser. No. 546,483
Claims priority, application Japan, Nov. 1, 1982, 57-192091
Int. Cl.[4] B62K *25/10*
U.S. Cl. 180—227 **9 Claims**



1. A vehicle body position control system for use in a vehicle including a body and at least one rear wheel, said position control system comprising:

a buffer having (i) an elastic support elastically supporting said rear wheel on said vehicle body and (ii) a damper for generating a damping force for damping elastic vibrations of said elastic support,

said elastic support comprising a spring elastically contractible and expansible in response to vibrations transmitted from said rear wheel,

said damper comprising:

a cylinder engaging one end of said spring and defining therein a cylinder chamber filled with operating fluid,

a piston slidably received within said cylinder chamber and separating said cylinder chamber into first and second cylinder chambers,

communication passage means formed in said piston and communicating said first and second cylinder chambers with each other, and

means responsive to elastic contraction and expansion of said spring for imparting flow resistance to said operating fluid flowing in said communication passage means to thereby generate said damping force;

a deceleration sensor for sensing decelerating conditions of said vehicle and generating an output signal indicative of a sensed decelerating condition of said vehicle;

a damping force adjuster responsive to said output signal for adjusting said damping force of said damper of said buffer, said damping force adjuster being adapted to adjust said damping force so as to retard a motion of said rear wheel in a direction away from said vehicle body at a larger rate when said output signal is generated than when said output signal is not generated;

a tank having an interior filled with operating fluid; a second damping force adjuster having second communication passage means communicating the interior of said tank with one of said first and second cylinder chambers which has operating fluid pressure therein increased when said spring is contracted;

valve means for closing and opening said second communication passage means; and

means responsive to said output signal from said deceleration sensor for actuating said valve means to open said second communication passage means at a value of operating fluid pressure within said one of said first and second cylinder chambers lower than a value of said operating fluid pressure at which said valve means is opened when said output signal from said deceleration sensor is not generated, thereby reducing the damping force of said damper of said buffer during contraction of said spring at deceleration of said vehicle.

4,572,318

FOUR-WHEEL DRIVE VEHICLE TRANSMISSION SYSTEM

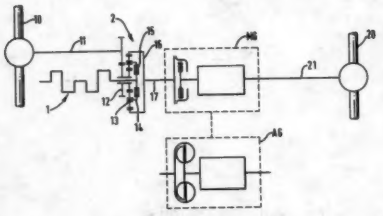
John B. Cady, Hampton-in-Arden, Great Britain, assignor to Jaguar Cars Limited, Allesley, England

Filed Jun. 7, 1984, Ser. No. 618,355

Claims priority, application United Kingdom, Jun. 8, 1983, 8315747

Int. Cl.⁴ B60K *17/344*

U.S. Cl. 180—248 **4 Claims**



1. In a four-wheel drive vehicle having an engine and front and rear driving axles, a power transmission means from said engine to said axles comprising an epicyclic gear set having an input and first and second outputs and a variable ratio gearbox, a first driving connection from said engine to said epicyclic gear set input, a second driving connection from said second output to said front axle, a third driving connection from said first output to said gearbox and a fourth driving connection from said gearbox to said rear axle.

4,572,319

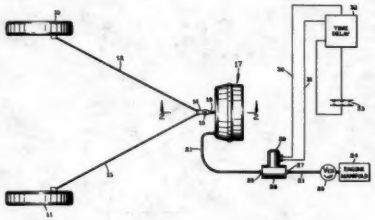
AUTOMATIC VEHICLE BRAKING SYSTEM

William G. Fontaine, Pompano Beach, Fla., assignor to Fail Safe Brake Corporation, Coral Springs, Fla.

Filed Oct. 3, 1984, Ser. No. 657,191

Int. Cl.⁴ B60K *27/08*

U.S. Cl. 180—273 **6 Claims**



1. In a vehicle braking system for an automotive vehicle having an engine with an intake manifold that is under partial vacuum when the engine is running and substantially at atmospheric pressure when the engine is off, said braking system comprising:

a brake actuator having a movable pressure-responsive member therein and having a variable-volume chamber on one side of said pressure-responsive member;

linkage means operatively connecting said pressure-responsive member to a vehicle brake to apply and release the latter in accordance with the position of said pressure-responsive member in said actuator;

spring means in said actuator biasing said pressure-responsive member to a brake-applying position;

a fluid conduit connecting said chamber to the engine manifold to apply a substantial partial vacuum to said chamber for moving said pressure-responsive member against the bias of said spring means to a brake-releasing position when the engine is running;

and a pressure-responsive valve in said conduit which is operable to open automatically to connect said actuator chamber to the engine manifold in response to a substantial partial vacuum in said manifold, said valve being operable to provide restricted fluid communication between the engine manifold and said actuator chamber to apply atmospheric pressure to said actuator chamber after a time delay.

4,572,320

AUTOMATIC DOOR LOCK PREVENTION SYSTEM

Robert W. Robbins, Jr., 3341 Laurel Grove S., Jacksonville, Fla. 32217

Filed May 21, 1984, Ser. No. 612,453

Int. Cl.⁴ B60R *18/00*

U.S. Cl. 180—289 **12 Claims**

1. A system for an automobile to prevent the driver from locking the doors when the ignition key is in the ignition lock and the driver is outside the automobile comprising:

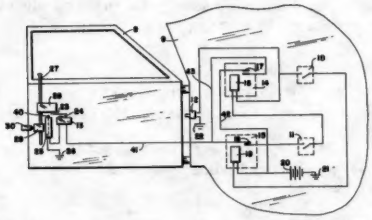
a. a source of electric current;

b. a first switch means associated with the ignition lock and

adapted to be closed when said key is in said lock, said first switch being connected to said source of electric current;

c. a second switch associated with the front door on the driver's side of said automobile and adapted to be closed when said door is open, said second switch being connected in series with said first switch;

d. means for locking said door from inside the automobile;



e. a third switch means associated with a solenoid operated means adapted to unlock said door when said third switch means is closed; said third switch adapted to be closed by the driver activating said means for locking said door from inside the automobile; and

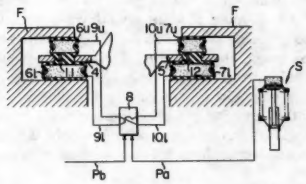
f. relay means connected in series between said first switch means and said third switch means.

4,572,321

ENGINE-MOUNTING STRUCTURE

Isamu Morita, Asaka, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 11, 1982, Ser. No. 357,325
Claims priority, application Japan, Mar. 11, 1981, 56-35010
Int. Cl.⁴ B60K *5/04*
U.S. Cl. 180—297 **1 Claim**



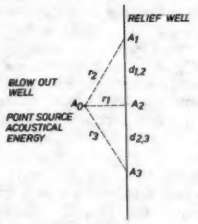
1. An engine mounting structure comprising a first and a second bracket extending from the engine casing in opposite directions at right angles to the output shaft of the engine, a first pair of upper and lower supporting units bearing against the upper and lower surfaces of said first bracket and each including a fluid-filled variable-volume chamber, and a second pair of upper and lower supporting units bearing against the upper and lower surfaces of said second bracket and each including a fluid-filled variable-volume chamber, said respective first and second pairs of upper and lower supporting units being clampingly held by a vehicle body from upper and lower sides thereof, wherein said variable-volume chamber in the upper supporting unit in said first pair is placed in fluid communication with the one in the lower supporting unit in said second pair via first passage means; said variable-volume chamber in the lower supporting unit in said first pair is placed in fluid communication with the one in the upper supporting unit in said second pair via second passage means; the lower supporting units in said first and second pairs have larger, effective pressure-bearing areas than the upper supporting units of the first and second pairs, respectively; the variable-volume chambers in the upper and lower support units in each of said first and second pairs of said supporting units are in fluid communication with each other by orifice means; and said upper and lower supporting units in said first and second pairs are each formed of bellows having its top and bottom closed excluding openings thereof leading to said first and second passage means and to said orifice means.

4,572,322

FINDING DISTANCE TO BLOWOUT USING WELLBORE ACOUSTIC MEASUREMENTS

Forrest R. Mitchell, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Jun. 23, 1983, Ser. No. 506,962
Int. Cl.⁴ G01V *1/40*
U.S. Cl. 181—105 **9 Claims**



1. A method for finding the distance to a blowout well from a relief well drilled to intercept a formation feeding said blowout well comprising:

first measuring the amplitude of acoustic energy in the relief well at a plurality of positions located at different depths including a position where the amplitude of acoustic energy in the relief well is a maximum;

second measuring the amplitude of background acoustic energy contributed by a line source in the relief well, subtracting said amplitude of said background acoustic energy from each of said first measurements of the amplitude of acoustic energy and plotting the difference with respect to depth at which each said first measurement was made to obtain corrected values of said first mentioned measured values of the amplitude of acoustic energy;

assuming a value for compressional wave velocity and absorption coefficient based on data available in the formation;

measuring a distance along the longitudinal axis of the relief well between at least two of said first mentioned measurements of the amplitude of acoustic energy, one of the at least two first mentioned measurements being the maximum first measurement obtained

and is assumed to be a point in the relief well nearest to an assumed acoustic point source at the blowout well; and

calculating a distance between the point

in the relief well assumed nearest to the assumed acoustic point source at the blowout well and the assumed acoustic point source at the blowout well using said at least two of said corrected values of the amplitude of acoustic energy and said assumed values of compressional wave velocity and absorption coefficient.

4,572,323

HEARING PROTECTORS

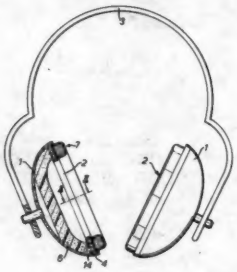
Mervyn D. G. Randall, Surrey, England, assignor to Racal Safety Limited, Wembley, England

Filed Mar. 20, 1984, Ser. No. 591,455

Claims priority, application United Kingdom, Mar. 28, 1983, 8308484

Int. Cl.[4] H04R *25/00*

U.S. Cl. 181—129 7 Claims



1. A hearing protecting device for protecting the hearing of a wearer comprising a shell defining a hollow enclosure with an open mouth which is, in use, placed over an ear of the wearer, a resiliently deformable annular sealing means extending along said open mouth of said enclosure for sealing against said shell and against the wearer, said sealing means having an inner peripheral portion, said shell comprising an annular flange at said open mouth, said flange having inner and outer surfaces and extending inwardly from the periphery of the mouth across the mouth of the enclosure and providing an annular surface which said sealing means overlies and against which said sealing means seals, said flange having an inner peripheral edge portion, and retaining means for releasably retaining said sealing means relative to said shell comprising an annular member made integral with said inner peripheral portion of said sealing means and adapted to extend around the inner peripheral edge portion of the flange and underlie the inner surface of said flange, said annular member and said inner surface comprising the sole retaining means for said sealing means.

4,572,324

EAR PIECE CONSTRUCTION

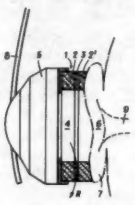
Werner Fidi, Baden, and Friedrich Richter, Klosterneuburg, both of Austria, assignors to AKG Akustische u.Kino-Geräte Gesellschaft mbH, Austria

Filed May 10, 1984, Ser. No. 608,973

Claims priority, application Austria, May 26, 1983, 1930/83

Int. Cl.[4] H04R *25/00*

U.S. Cl. 181—129 10 Claims



1. An ear piece for a sound reproducing device, comprising an annular ear cushion of a size to engage against an outer ear and comprising at least one annular part of an elastic, soft, sound impermeable foam and at least one annular part of a sound permeable layer which is thin in relation to the overall thickness of said cushion and which has a defined acoustic impedance for low and medium frequencies of the audibility range and acts as a frictional resistance, a central portion of said ear cushion forming a coupling space from the sound producing device to the ear and the ear piece representing an acoustic connection from the sound producing device to the ear, the frictional resistance acting between the coupling space and an exterior of the coupling space.

4,572,325

STEREOPHONIC BAFFLE

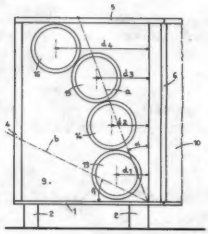
Walter Schupbach, 4, route de Benex, 1197 Prangins, Switzerland

Filed Oct. 27, 1983, Ser. No. 546,195

Claims priority, application Switzerland, Dec. 23, 1982, 7517/82

Int. Cl.[4] H05K *5/00*

U.S. Cl. 181—145 12 Claims



1. Monolithic stereophonic baffle with plain top, bottom, front and side walls and a central partition that divides the baffle into two equal chambers; each of said chambers comprising a rear wall on which a plurality of loud-speakers are mounted all directed to emit sound waves rearwardly; the loud-speakers being symmetrically disposed with respect to the central partition; the location of each loud-speaker of said plurality of loud-speakers on each rear wall being such that any one loud-speaker, the central of which is closer to said bottom wall than the center of any other loud-speaker of said plurality of loud-speakers has its center also closer to the central partition than any other loud-speaker of said plurality of loud-speakers.

4,572,326

MOTOR VEHICLE LOUDSPEAKER INSTALLATION

Bruce E. Hutchins, Milford, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Dec. 20, 1979, Ser. No. 105,511

Int. Cl.[4] H05K *5/00*

U.S. Cl. 181—150 1 Claim

1. A loudspeaker installation for a motor vehicle comprising in combination:

a rear shelf extending across a rear portion of the interior of the vehicle separating the passenger compartment and the trunk, said shelf having first and second openings therethrough;

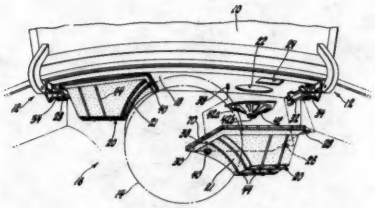
a loudspeaker suspended into said trunk and secured to said rear shelf about said first opening;

a loudspeaker housing defined by rigid wall sections disposed in said trunk about said loudspeaker and said second opening, said housing being secured to said rear shelf to define a rigid shroud acoustically isolating said loudspeaker and said passenger compartment from said trunk;

a rigid U-shaped channel member conforming to inner walls of said housing, the sides of said channel having peripheral

lip areas extending perpendicularly therefrom that form a broad contacting surface; and

means for attaching said channel member lip areas to said inner walls, said channel member and said inner walls thereby defining a duct inside said housing, one end of said duct being in communication with said passenger compartment through said second opening in said rear shelf and the other end being in communication with the interior of said shroud, whereby audio signals produced by said loudspeaker are emitted from said first and second rear shelf openings in a manner to increase the low frequency audio response of the installation.

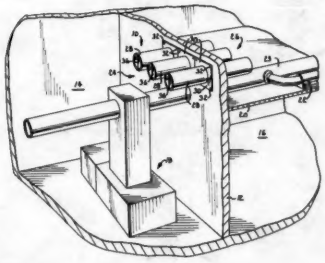


4,572,327

SOUND ATTENUATOR

Raymond H. Dean, Shawnee Mission, Kans., assignor to Tempmaster Corporation, North Kansas City, Mo.

Filed Nov. 7, 1984, Ser. No. 668,952
Int. Cl.[4] E04B *1/82*
U.S. Cl. 181—295 **20 Claims**



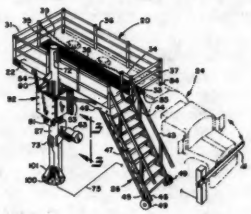
1. Noise attenuating apparatus for inhibiting transmission of sound waves in a low frequency waveband between spaces on opposite sides of a wall, said apparatus comprising an array of tubes including at least three spaced apart tubes arranged on the wall parallel to one another and projecting from the wall into at least one of the spaces a distance of between one sixth and one third of a wavelength of sound in air at the highest frequency in the waveband, each tube being substantially circular in cross section and having a diameter less than approximately one sixth of a wavelength of sound in air at the highest frequency in the wavelength, and each tube having a cross sectional area substantially less than the corresponding cross sectional dimensions of the spaces.

4,572,328

SAFETY PLATFORM

John C. Benko, 6226 Oakwood Cir., North Ridgeville, Ohio 44039

Filed Mar. 14, 1985, Ser. No. 711,733
Int. Cl.[4] E04G *1/18, 1/26*
U.S. Cl. 182—1 **17 Claims**



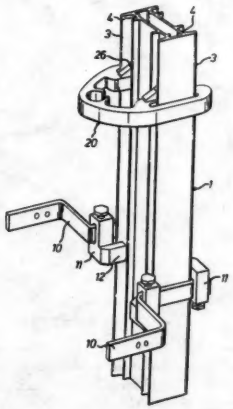
1. A vertically movable safety platform for providing a safety railing enclosed work area on top of mobile equipment such as tank trucks and the like comprising a vertically extending mast, a platform cantilevered from said mast, and power means for vertically moving said platform along said mast, said platform including a safety railing which extends beyond one edge of said platform so that when said platform is lowered on top of said mobile equipment said safety railing encloses said platform and a portion of the top of said mobile equipment to provide such safety railing enclosed work area.

4,572,329

RAIL ASSEMBLY WITH CLIMBER SHOES AND FALL-PREVENTING MEANS

Rolf Kleveborn, Tyresö, Sweden, assignor to AB Linjebyggnad, Stockholm, Sweden

Filed Oct. 16, 1984, Ser. No. 661,317
Claims priority, application Sweden, Oct. 20, 1983, 8305790
Int. Cl.[4] A63B *27/04*
U.S. Cl. 182—9 **6 Claims**



1. A combination comprising: a rail constructed for climber shoes and fall-preventing means and adapted for mounting to posts, masts, construction elements, chimneys or the like; a pair of climber shoes constructed for coaction with such a rail; and a fall-preventing means constructed for coaction with such a rail and including a runner adapted to run along the rail, wherein the rail (1) consists of a preferably hollow web portion

of rectangular cross-section having flanges (3) arranged pairwise and projecting from opposite edges of two opposite sides (2); portions (4) of the two sides of the web portion which are situated adjacent the flanges being adapted to form abutment surfaces for engaging portions in both the oppositely directed flanges (3) for the gripping members of climber shoes, fall-preventing means gripping the respective web portion edge; the climber shoe including a bar (10) connected with a shoe plate or the like (8); and a gripping means connected with said bar, said gripping means being arranged at the free end of said bar and comprising two spaced-apart members (12,14) arranged on the bar and having generally parallel opposite projections (12) situated at a distance from the bar side adjusted to the rail flange thickness; said projections having a free length exceeding the extent of the outer flanges (3) of the rail (1), as counted from the abutment surface (4) of the respective web side, and relatively displaced in the transverse sense of the bar; and the fall-preventing means including a harness and a runner (20) adapted to run along the rail and consisting of a generally U-shaped body; oppositely directed, generally L-shaped projections (21) being arranged on the insides of the shank portions of said body; the oppositely directed, substantially crosscut end surfaces (22) of the projections (21) being situated at a relative distance that is greater than the distance between those engagment surfaces (4) of the web portion of the rail which face away from each other; the shanks of the L-shaped projections being situated at a distance from each other exceeding the distance between the outwardly facing edges of the outer flanges (3) of the rail (1); and one pair (25) of diagonally opposite corners of the L-shaped projections (21) at either shank being provided with antifriction means (26), while the other pair (28) of diagonally opposite corners are sharp.

4,572,330

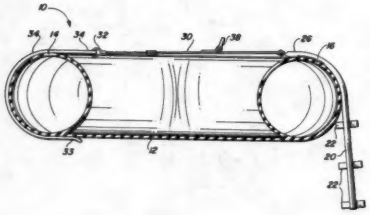
LADDER FOR BOARDING SMALL BOATS

Donald R. Langevin, 1739 SE. 46th La., Cape Coral, Fla. 33904

Filed May 30, 1985, Ser. No. 739,341

Int. Cl.[4] B63B *35/58, 29/20;* E06C *1/58*

U.S. Cl. 182—206 **7 Claims**



1. A boat ladder for boarding an inflatable pontoon boat, dinghy or similar small craft of the type having opposed and generally parallel gunwales, said boat ladder comprising:

two generally parallel ladder supports, each support having a first end thereof bendable across one of said gunwales;

plural and parallel ladder steps extending between said two ladder supports;

a strap coupled at one end to said first end of both of said ladder supports, said strap being adjustable to extend across the space between said gunwales; and

means for coupling the other end of said strap to the other of said gunwales, whereby the weight of a person climbing up said ladder is distributed across both of said gunwales.

4,572,331

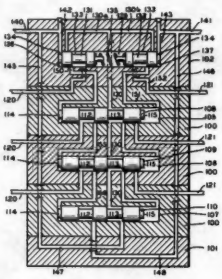
REVERSIBLE FEEDER SYSTEM

John H. Powell, Twinsburg, and James J. Callahan, Mentor, both of Ohio, assignors to Lubriquip - Houdaille, Inc., Warrensville Heights, Ohio

Filed Apr. 19, 1984, Ser. No. 602,133

Int. Cl.[4] F16N *25/02*

U.S. Cl. 184—7.4 **9 Claims**



2. A series progressive lubricant feeder comprising: a valve block assembly including a plurality of individual spool valve assemblies arranged in series relationship, each spool valve assembly including a spool movable in a valve bore having end chambers and port means for the end chambers with at least some of the port means communicatable with dispensing outlets intermediate the end chambers of another spool valve assembly, a feed line in said valve block assembly communicating with a plurality of said end chambers to feed lubricant to said chambers, two valve block inlet-outlet ports, control valve means, passages interior of the valve block assembly communicating the two inlet-outlet ports with one another and with the feed line, and said control valve means including a first valve bore and a pair of spools in said first valve bore.

4,572,332

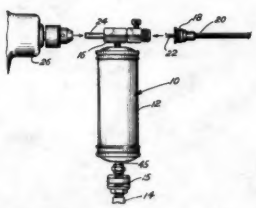
SPEEDOMETER CABLE LUBRICATION TOOL

James L. Pool, Clarinda, Iowa, assignor to Lisle Corporation, Clarinda, Iowa

Filed Jun. 14, 1984, Ser. No. 620,805

Int. Cl.[4] F16N *21/00*

U.S. Cl. 184—15.1 **3 Claims**



1. A cable lubricator tool for lubricating a rotatable drive cable within a cable housing comprising, in combination:

an adapter having a throughbore for lubricant flow and also having connecting means for attachment to a drive cable housing;

a lubricant storage tube with a translatable piston in the tube, said piston defining a lubricant chamber in the tube;

a lubricant flow connection from the tube chamber to the throughbore of the adapter housing;

a cable drive shaft extending through a sealed passage in the adapter and into the throughbore for attachment to a

drive cable, said shaft and throughbore defining a passage for lubricant flow into an attached cable housing;

means for attaching the drive shaft for rotating the shaft and an attached drive cable;

said adapter throughbore having a lesser diameter bearing passage which is coaxial with a lubricant passage, and said drive shaft comprising a cylindrical shaft member having substantially the same diameter as the bearing passage and rotatable in the bearing passage, one end of said shaft member projecting from the adapter for attachment with drive means and the opposite end of said shaft member projecting into the lubricant passage and including means for attachment to a drive cable;

said shaft member also including a shoulder intermediate its ends to limit translation of the shaft through the bearing passage and maintain the shaft in a substantially non-translatable position when the tool is attached to a drive cable and associated housing;

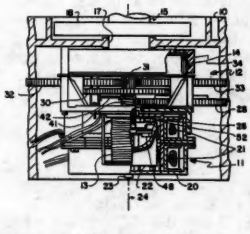
said shaft member having a substantially uniform diameter and being reversibly positionable in the throughbore, said shoulder being an unequal distance from each end of the shaft to thereby accommodate distinct sizes of drive cable assembly by reversal of the shaft in the adapter whereby the piston is translatable in the chamber to compress lubricant in the chamber and transfer lubricant from the chamber into the throughbore of the adapter housing and thus into the drive cable housing attached to the adapter as the drive cable is rotated.

4,572,333

SPEED GOVERNING AND DECOUPLING DRIVE MECHANISM

Curtis E. Westley, St. Louis Park, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Apr. 16, 1984, Ser. No. 600,743
Int. Cl.[4] F03G *1/08*; F16D *67/02, 59/00*
U.S. Cl. 185—40 R **20 Claims**



1. A drive mechanism comprising:

a member rotatable about an axis and slidable along the axis between first and second axial positions;

first motor means rotationally coupled to said member tending to drive said member at an uncontrolled speed;

second motor means having a rotor which exhibits significant reluctance to rotation when said second motor means is unenergized;

coupling means operable to rotationally couple said member to the rotor when said member is in the first axial position, whereby said member may be driven by said second motor means;

a drum on the rotor in said second motor means;

weight means mounted on said member and adapted for radial displacement by centrifugal force resulting from rotation of said member faster than a predetermined speed, said weight means being located within said drum when said member is in the second axial position, said weight means having shoe means thereon which frictionally engage said drum so as to govern the speed of said member by reaction forces from the rotor when said member is being driven by said first motor means; and

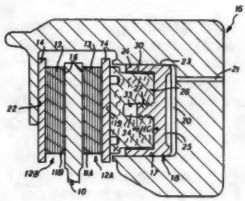
positioning means for positioning said member in the first or second axial positions.

4,572,334

HYDRAULICALLY CONTROLLED BRAKE

Gino Villata, Buttigliera d'Asti, Italy, assignor to Valeo, Paris, France

Filed May 8, 1984, Ser. No. 608,234
Claims priority, application France, May 11, 1983, 83 07869
Int. Cl.[4] F16D *55/02, 55/18*
U.S. Cl. 188—71.6 **20 Claims**



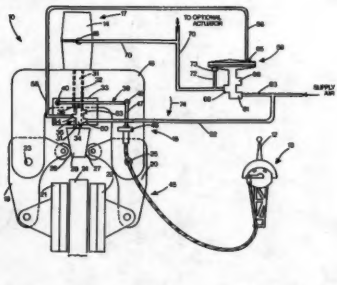
1. A hydraulic controlled brake comprising at least one friction element adapted to be applied against a braking member, a hydraulic cylinder, a piston slidably mounted in said cylinder for movement in response to pressure, for applying said friction element against the braking member, said piston being of generally cup-shaped configuration and having a cylindrical side wall received in said cylinder, a bottom wall defining a control chamber with said cylinder, a threaded central portion projecting from the bottom wall of said piston into an internal space defined by said cup-shaped piston, and a mechanically resistant cylindrical core of friction lining material received in said internal space and threadedly engaged with said threaded central portion for securing said core on said piston.

4,572,335

BRAKE ACTUATING SYSTEM

Jacob Kobelt, 6110 Oak St., Vancouver, British Columbia, Canada (V6M 2W2)

Filed Mar. 11, 1983, Ser. No. 474,494
Int. Cl.[4] F16D *55/08, 55/16*
U.S. Cl. 188—72.1 **15 Claims**



1. A brake actuating system for use with a brake assembly, the brake assembly having: a brake body, an extensible and retractable brake actuator having an actuator fluid input means, and at least one friction member cooperating with the actuator and the brake body so as to brake a brakeable member, the brake actuating system having:

(a) a first fluid valve means having: a valve body secured to a means responsive to actuation of the actuator; a supply

fluid input means adapted to receive pressurized supply fluid; a signal input means movable relative to the body to control the supply fluid passing through the valve, an exhaust means to exhaust the fluid; and a fluid output means to discharge fluid at an output pressure which is controlled by the signal input means,

(b) a coupling means having first and second portions, the first portion cooperating with the signal input means of the first fluid valve means and an operator's control, and the second portion cooperating with the operator's control and the brake body,

so that a change in brake signal from the operator's control causes a corresponding change in extension of the actuator which produces a corresponding change in output signal to the actuator.

11. A fluid actuated braking apparatus having:

(a) a brake assembly having a brake body, an extensible and retractable brake actuator having an actuator fluid input means, and at least one friction member cooperating with the actuator and a brake body so as to brake a brakeable member,

(b) a brake actuating system having a first valve means having: a valve body secured to a means responsive to actuation of the actuator; a supply fluid input means adapted to receive pressurized supply fluid; a signal input means movable relative to the body to control the supply fluid passing through the valve; an exhaust means to exhaust the fluid; and a fluid output means to discharge the fluid at an output pressure which is controlled by the signal input means,

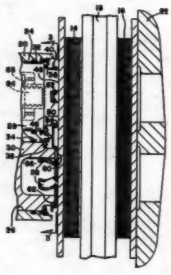
(c) a coupling means having first and second portions, the first portion cooperating with the signal input means of the first fluid valve means and an operator's control so as to receive a brake signal from the operator's control, and the second portion cooperating with the operator's control and the brake body,

so that a change in brake signal from the operator's control causes a corresponding change in extension of the actuator which produces a corresponding change in output signal to the actuator.

4,572,336
DISC BRAKE AND ANTI-ROTATIONAL HEAT SHIELD THEREFOR

Roger L. Smith, Niles, Mich., and John R. Wegh, South Bend, Ind., assignors to Allied Corporation, Morristown, N.J.

Filed Jun. 20, 1983, Ser. No. 505,596
Int. Cl.⁴ F16D *55/04*
U.S. Cl. 188—72.6 **8 Claims**

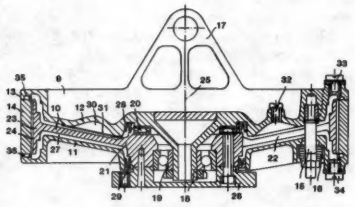


1. A disc brake comprising a caliper cooperating with a pair of friction pads to urge the latter into engagement with a rotor to be braked, the caliper including a pair of pistons opposing one of the friction pads, a parking device cooperating with one of the pistons and means substantially preventing rotation of the one piston when the parking device is actuated, characterized in that said means comprises a plate means extending between said pair of pistons and operatively connected thereto such that rotation of said one piston imparts slight rotation to said plate means and said other piston opposes the rotation of said plate means and said one piston.

4,572,337
AZIMUTH DAMPER

Arnold Johansson, Karlskoga, Sweden, assignor to Aktiebolaget Bofors, Bofors, Sweden

PCT No. PCT/SE83/00241, § 371 Date Feb. 6, 1984, § 102(e) Date Feb. 6, 1984, PCT Pub. No. WO84/00061, PCT Pub. Date Jan. 5, 1984
PCT Filed Jun. 14, 1983, Ser. No. 597,157
Claims priority, application Sweden, Jun. 14, 1982, 8203657
Int. Cl.⁴ F16F *9/30*
U.S. Cl. 188—268 **10 Claims**



1. A fluid damper for damping aiming movements comprising:

a substantially disc-shaped, cylindrical damper housing having a bottom part and a cover;

a drum wheel secured between said bottom part and said cover and supported for rotation in said housing;

a slipping ring said slipping ring being secured to permit sliding movement between said slipping ring and said damping housing when a specific damping torque is exceeded, and integrated in an outer cylindrical wall of said damper housing,

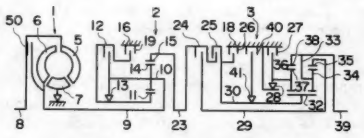
said slipping ring further being spaced from a peripheral, cylindrical, surface of said drum wheel to provide an inner gap spacing therebetween; and

a highly viscous damping fluid disposed within said gap between said slipping ring and the peripheral cylindrical surface of said drum wheel.

4,572,338
LOCK-UP CLUTCH SYSTEM FOR VEHICULAR AUTOMATIC TRANSMISSION

Nobuaki Miki, Kariya, Japan, assignor to Aisin-Warner Kabushiki Kaisha, Anjo, Japan

Continuation of Ser. No. 374,698, May 4, 1982. This application Nov. 21, 1984, Ser. No. 674,702
Int. Cl.⁴ B60K *41/22*
U.S. Cl. 192—3.29 **1 Claim**



1. In a lock-up clutch system for vehicular automatic transmission including a lock-up control circuit for controlling a direct coupling clutch of a torque converter, said circuit comprising:

(a) a lock-up control valve (293) having a spool (292) which

is movably provided between a lock-up position in which said direct coupling clutch is actuated and a release position in which said direct coupling clutch is deactuated;

(b) a spring disposed to always urge said spool (292) toward said release position;

(c) at least four oil passages each disposed to communicate with said lock-up control valve (293);

(d) first oil passage (114) constantly directing oil pressure in the direction in which said spool (292) moves toward said release position;

(e) second oil passage (113) directing oil pressure in the direction in which said spool (292) tends to move toward said lock-up position against the force of said spring in company with shifting gear into a speed position higher than predetermined gear position;

(f) third oil passage (120) selectively communicated with fourth and fifth oil passages (122), (121) in response to the movement of said spool (292) to occupy it at the release and lock-up positions;

(g) said first and second oil passages (114), (113) being individually arranged which inhibit to form a communication except for the position in which said lock-up valve occupies; and

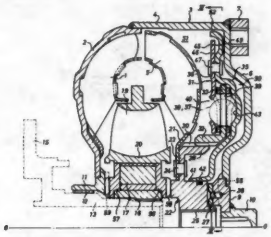
(h) an electromagnetic solenoid valve (420) provided in said first oil passage to release the fluid oil thereof exterior upon energization so as to move said spool (292) from said release position to said lock-up position to communicate said third oil passage (120) with said fourth passage (122).

4,572,339

LOCK-UP CLUTCH OF A TORQUE CONVERTER

Masahiko Koshimo, Osaka, Japan, assignor to Kabushiki Kaisha Daikin Seisakusho, Osaka, Japan

Filed Sep. 23, 1983, Ser. No. 535,965
Claims priority, application Japan, Sep. 28, 1982, 57-170463
Int. Cl.⁴ F16D *3/66, 13/68, 33/00*
U.S. Cl. 192—3.31 **4 Claims**



1. A lock-up clutch, for a torque converter including a turbine enclosed in a cylindrical cover having an annular end wall, said clutch comprising:

a disc hub axially slidably connected to a hub of said turbine for rotation therewith and having a radial hub flange with circumferentially extending openings formed therein;

a clutch disc comprising a first annular side plate slidably mounted for axial and radial movement on said turbine hub within said torque converter cover adjacent said end wall and having an annularly hollowed portion, a second annular side plate attached to said first side plate near the outer periphery thereof and having an inwardly extending portion substantially parallel to and spaced from said annularly hollowed portion of said first side plate, said disc radial hub flange extending radially outwardly between said spaced side plate portions;

torsion spring mechanisms consisting of plural elastic members disposed in series in said circumferentially extending hub flange openings and floating spacers between adjacent pair of said elastic members, said torsion spring mechanisms being laterally retained in said openings by said spaced portions of said side plates;

friction means fixed on a radially outer portion of said first side plate and adapted to be axially pressed against an inner surface of said end wall; and

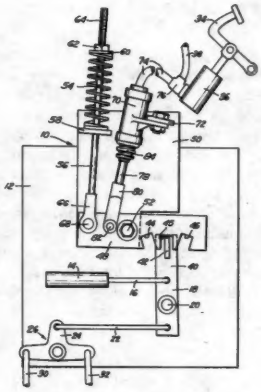
forcing means adapted to urge said clutch disc axially to press said friction means against said inner surface of said end wall.

4,572,340

SAFETY LOCK VEHICLE TRANSMISSION

Kenneth E. Pierce, 6577 Frank St., Mira Loma, Calif. 91752

Filed May 20, 1983, Ser. No. 496,546
Int. Cl.⁴ B60K *41/26*; F16D *41/24*
U.S. Cl. 192—4 C **4 Claims**



1. For use with an industrial vehicle having a transmission with a gear shift actuator that is rotatable between forward, neutral and reverse positions, and a braking system; the improvement comprising a safety locking device consisting of:

a lever fixed to the gear shift actuator and rotatable therewith, said lever having a first locking formation provided thereon;

a member pivoted for rocking movement between a first position and a second position, said member having a second locking formation provided thereon which is operable when the member is in said first position to engage said first locking formation on said lever when the latter is in any one of its three positions, and when the member is in said second position to disengage and release said first locking formation;

means yieldingly urging said member to said first position; and

other means responsive to actuation of the vehicle's braking system to move said member from said first position to said second position against the resistance of said first-named means, whereby the gear shift actuator is released and can be rotated from one of its positions to another only while the braking system is being actuated.

4,572,341
SELF-ADJUSTING RELEASE SYSTEM FOR FRICTION CLUTCHES

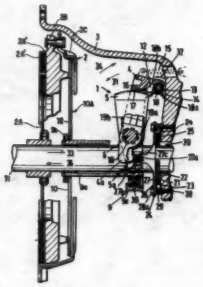
Paul Maucher, Sasbach, Fed. Rep. of Germany, assignor to LUK Lamellen und Kupplungsbau GmbH, Bühl, Fed. Rep. of Germany

Filed Mar. 22, 1984, Ser. No. 592,240

Claims priority, application Fed. Rep. of Germany, Apr. 14, 1983, 3313551

Int. Cl.[4] F16D *13/75, 67/02*

U.S. Cl. 192—13 R **20 Claims**



1. A release system, particularly a selfadjusting release system for friction clutches of the type having a rotary output element, a brake which is actuatable to decelerate the output element and a component movable to and from a clutch-actuating position, comprising input and output members pivotable in first and second directions; means for pivoting one of said members in said first direction; means for releasably coupling said members for joint movement in said first direction, the other of said members having means for advancing said component to said clutch-actuating position in response to pivoting in said first direction and said one member having means for actuating said brake upon actuation of the clutch by said component through the medium of said other member; and means for moving said members in said second direction.

4,572,342
TORQUE-LIMITING CLUTCH

Hermann Weiss, and Rudolf Weiss, both of Vreden, Fed. Rep. of Germany, assignors to ATEC-Weiss KG, Vreden, Fed. Rep. of Germany

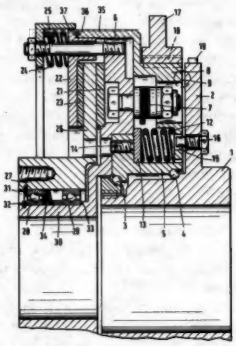
Filed Nov. 9, 1983, Ser. No. 550,524

Claims priority, application Fed. Rep. of Germany, Nov. 12, 1982, 3241914

Int. Cl.[4] F16D *7/06*

U.S. Cl. 192—56 R **8 Claims**

1. A torque-limiting clutch comprising: a hub; two clutch halves including one axially movable clutch half; a spring forcing the two clutch halves into engagement; an engagement lock disposed between the hub and one clutch half forming a force transmission path and comprising two parts held in engagement by spring loaded engagement means and means mounting one part for axial adjustment when a limiting torque acting on the hub is exceeded, the mounting means comprising a locking device between the two parts and a path of travel for the locking device having an ascending curve with a first portion having a greater steepness than a second portion, and a further spring acting on the adjustable part when disengaged, the adjustable part acting to disengage the clutch havles when the limiting torque is exceeded, means mounting the two parts for rotational movement relative to each other and a stop for limiting the rotation, a switching ring mounted on said adjustable part to be rotatably fixed and axially displaceable with respect thereto and having a switch point, a nose on the other part for interacting with the switch point to guide the parts



back into engagement upon axial displacement of the switching ring.

4,572,343
ELECTROMAGNETIC FRICTION CLUTCH

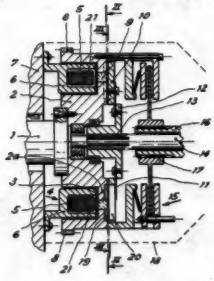
Pier C. Boffelli, San Donato, Italy, assignor to Baruffaldi Frizioni S.p.A., Milano, Italy

Filed Apr. 23, 1984, Ser. No. 603,129

Claims priority, application Italy, Apr. 27, 1983, 20799 A/83

Int. Cl.[4] F16D *7/02, 23/00, 43/20*

U.S. Cl. 192—56 R **15 Claims**



1. An electromagnetic friction clutch comprising a driving motor having a sufficient moment of inertia and mass to constitute a flywheel, an armature frictionally engageable with said rotor in driven relationship, electromagnetic control means operable to engage said armature with said rotor and electromagnetic sensor means responsive to changes in reluctance and magnetic flux resulting from slip between said rotor and said armature to disengage said armature from said rotor when said changes exceed a predetermined value.

4,572,344
CLUTCH DISK

Yusuke Horiuchi, and Hisao Ootani, both of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Jun. 30, 1983, Ser. No. 509,657

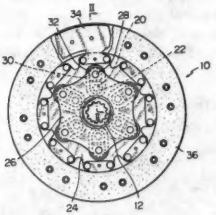
Claims priority, application Japan, Nov. 8, 1982, 57-167979

Int. Cl.[4] F16D *47/02*

U.S. Cl. 192—106.1 **4 Claims**

1. A clutch disk having a hub and a clutch plate which are

operatively connected by at least two endless elastomer belts each of which is entrained over a pair of separate bushings, wherein one of said separate bushings is rotatably mounted on a hub pin attached to the hub and the remaining one of said pair of separate bushings is rotatably mounted on a plate pin attached to the clutch plate, and wherein each of said separate bushings has a semicylindrical side wall and a pair of flat side walls adjacent to said semicylindrical side wall and extending parallel to each other, said side wall and said flat sides contacting one of said belts.



4,572,345

CLUTCH PLATE

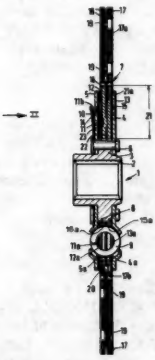
Kurt Frietsch, Bühlertal, Fed. Rep. of Germany, assignor to LUK Lamellen und Kupplungsbau GmbH, Bühl, Fed. Rep. of Germany

Filed Jun. 6, 1983, Ser. No. 501,272

Claims priority, application Fed. Rep. of Germany, Jul. 30, 1982, 3228458

Int. Cl.[4] F16D *3/14*

U.S. Cl. 192—106.2 **20 Claims**



1. A clutch plate, particularly for use in friction clutches of automotive vehicles, comprising a hub having two spaced-apart radially outwardly extending walls; carrier means having two spaced-apart rings movable angularly as a unit with reference to said hub, said rings having inner sections and outer sections, as considered radially of said hub, and said inner sections being disposed between said walls, said carrier means further comprising segments having inner portions disposed between and secured to the outer sections of said rings and outer portions, as considered radially of said hub; friction linings provided on the outer portions of said segments; distancing means provided between the inner sections of said rings and including at least one projection forming part of one of said rings and in contact with the other of said rings; and energy storing means interposed between said hub and said carrier means to yieldably oppose relative angular movement between the hub and the carrier means.

4,572,346

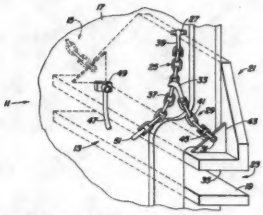
POWER PRESS RAM SAFETY GUARD WITH ELECTRICAL INTERLOCK

William R. Chestnut; Clive L. Parcell; Christopher J. Cox, and David J. MacKenzie, all of Ottumwa, Iowa, assignors to Deere & Company, Moline, Ill.

Filed Jan. 30, 1984, Ser. No. 575,413

Int. Cl.[4] F16D *71/04*; F16P *1/00*; B30B *15/28*

U.S. Cl. 192—134 **9 Claims**



1. In a power operated machine comprising a frame, a stationary work bed on said frame, a movable member reciprocable relative to said frame toward and away from said bed and at least one guard for selectively preventing movement of the movable member toward said bed, the improvement wherein said guard comprises:

a first elongate safety member having a first end fixed to said frame;

a second elongate safety member having a first end fixed to said movable member; attaching means forming a second end of said second safety member and being selectively attachable to said first safety member, when the movable member is in a position away from said bed such that the first and second safety members are a combined effective length operative for restricting movement of said movable member toward said bed.

4,572,347

STOREROOM FOR TRANSPORT CARTS, PARTICULARLY SUPERMARKET SHOPPING CARTS OR THE LIKE

Armin Eisermann, Velbert, Fed. Rep. of Germany, assignor to Schulte-Schlagbaum Aktiengesellschaft, Velbert, Fed. Rep. of Germany

Filed Oct. 9, 1984, Ser. No. 658,345

Claims priority, application Fed. Rep. of Germany, Oct. 3, 1983, 3336657

Int. Cl.[4] G07F *7/01*

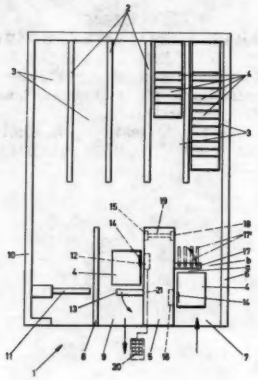
U.S. Cl. 194—205 **7 Claims**

1. In a storeroom for transport carts, having removal and return passage barriers, a money collection point for collecting money for opening of a passage point and a money return point upon the return of a transport cart to the storeroom, a data support coordinated with the transport cart and a reader for said data in the region of the removal and return passage barriers, the improvement wherein

each cart carries it individual data code, and

the reader comprises a removal reader for the removal passage barrier and a return reader for the return passage barrier, said removal reader being operatively coupled with said return reader such that the removal reader transmits the individual data code of the cart which said removal reader has read during removal of said cart from the storeroom to the return reader, and

the return reader comprises means for releasing a return of the money only upon the return of that transport cart



which is provided with said transmitted individual data code.

4,572,348

LOCK, PARTICULARLY A COIN-DEPOSIT LOCK

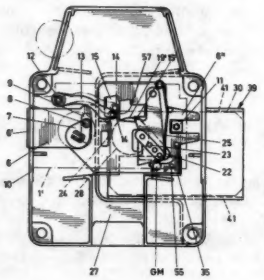
Armin Eisermann; Heinz ten Eicken; Kurt Obenlüneschloss, and Diethard Geiger, all of Velbert, Fed. Rep. of Germany, assignors to Schulte-Schlagbaum Aktiengesellschaft, Velbert, Fed. Rep. of Germany

Filed Nov. 10, 1983, Ser. No. 551,738

Claims priority, application Fed. Rep. of Germany, Nov. 13, 1982, 3242045

Int. Cl.[4] G07F *17/14*

U.S. Cl. 194—248 **15 Claims**



1. A lock adapted to be lockable upon insertion of a punch card having a hole therein, said lock comprising:

a lock case having a shaft for insertion therein of said punch card;

a bolt having a blocking shoulder moveably mounted in said case;

a counter-magnet mounted in said bolt in front of said blocking shoulder;

a punch card scanning device including,

an axially polarized magnetic pin moveably mounted in a bolt-side wall of said shaft for free movement transverse to movement of said bolt, wherein in an unlocked position of the bolt said counter-magnet pulls said magnetic pin into a bolt blocking position in front of said blocking shoulder; and wherein upon movement of said bolt from said unlocked position, said magnetic pin is released for movement from said blocking position into the hole in said punch card when said hole is aligned with said magnetic pin.

4,572,349

COIN CHECKING DEVICE FOR USE IN A COIN HANDLING MACHINE

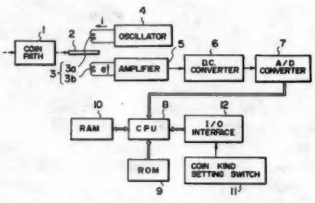
Katusuke Furuya, and Tomonari Sakurai, both of Tokyo, Japan, assignors to Laurel Bank Machine Co., Ltd., Tokyo, Japan

Filed Dec. 14, 1983, Ser. No. 561,379

Claims priority, application Japan, Dec. 16, 1982, 57-220552

Int. Cl.[4] G07F *3/02*

U.S. Cl. 194—318 **4 Claims**



1. A coin checking device for use in a coin handling machine for discriminating whether passing coins are genuine or counterfeit, said coin checking device comprising:

detection coil means for detecting an initial voltage and sequentially issuing a detection signal in accordance with the material properties of each of the passing coins,

receiving and generating means for receiving each detection signal from the detection coils and generating a variation value representing a maximum quantity of variation from said initial voltage for each detection signal,

storing means for storing each variation value,

reading means for reading from the storing means at least two immediately preceding variation values and averaging said at least two immediately preceding variation values to obtain a renewable reference value prior to reading a new variation value from said storing means,

first comparing means for comparing said renewable reference value with said new variation value to obtain a first difference therebetween, and

second comparing means for comparing said first difference with an acceptable value to obtain a second difference and issue a different kind coin mixture signal when the second difference exceeds the first difference.

4,572,350

APPARATUS FOR DIVERTING STACKS OF SHEETS IN PAPER PROCESSING MACHINES

Alfred Besemann, Hamburg, Fed. Rep. of Germany, assignor to E. C. H. Will GmbH & Co., Hamburg, Fed. Rep. of Germany

Filed Apr. 6, 1984, Ser. No. 597,760

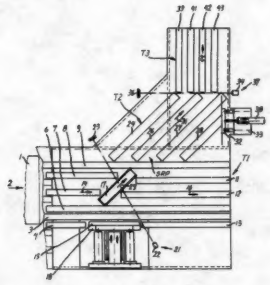
Claims priority, application Fed. Rep. of Germany, Apr. 9, 1983, 3312750

Int. Cl.[4] B65G *47/46*

U.S. Cl. 198—372 **35 Claims**

1. Apparatus for manipulating stacks of paper sheets or the like, comprising a first transporting unit arranged to advance a succession of stacks in a first direction, at a predetermined level and along a first path; a second transporting unit arranged to advance selected stacks of said succession along a second path and in a second direction at an oblique angle to said first direction, said second transporting unit having a stack-receiving portion adjacent to one side of said first path; a transfer conveyor normally disposed below said level and operable to advance selected stacks from said first path, in said second direction and onto the stack-receiving portion of said second transporting unit; means for raising and lowering said transfer

conveyor above and below said level so that, when raised, said transfer conveyor extends into said first path and transfers the oncoming selected stack into said second path; a pusher adjacent to the other side of said first path opposite the stack-receiving portion of said second transporting unit; means for moving said pusher transversely of said first path so that said



pusher assists said transfer conveyor in delivering selected stacks to the stack-receiving portion of said second transporting unit and preserves the orientation of selected stacks during such transfer; and a yieldable bumper disposed at said one side of said first path and arranged to deflect transferred stacks from said second path.

4,572,351

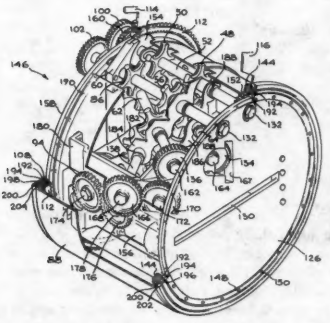
TRANSFER UNIT

Michael D. Golden, Costa Mesa, Calif., assignor to General Dynamics Pomona Division, Pomona, Calif.

Filed Nov. 13, 1979, Ser. No. 93,729

Int. Cl.[4] B65G *47/24;* F41D *10/22*

U.S. Cl. 198—412 **34 Claims**



1. A transfer unit for axial re-orientation of a plurality of linkless feed items following in succession comprising:

a support frame which is rotatable about a central axis under the control of an associated rotatable utilization means, the support frame being rotatable with the utilization means about coincident axes of rotation;

a first shaft rotatably mounted in said frame;

means for positively engaging said items for rotation about the axis of said shaft;

at least a second shaft rotatably mounted in said frame non-coplanar with said first shaft and oriented at a selected angle to said first shaft;

means for receiving said items from said first shaft and positively engaging them for rotation about said second shaft;

means for introducing said items individually in succession to said frame at an entry position rotatable with said frame, the introduced items having a first axial orientation generally parallel to said central axis, and delivering the items to the positively engaging means for rotation about said first shaft; and

means for discharging said items from said frame with a second axial orientation aligned in a plane generally perpendicular to said central axis, said second axial orientation being rotatable in said plane with the rotation of the support frame and the utilization means;

wherein said positively engaging means comprise sprockets mounted on said shafts.

4,572,352

APPARATUS FOR CONVEYING ROD-LIKE ARTICLES

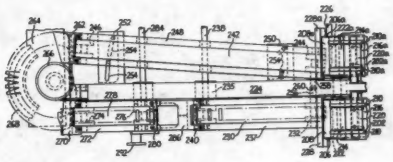
Derek H. Dyett; Grantley R. Hoath, and John K. Horsley, all of High Wycombe, England, assignors to Molins Limited, London, England

Filed Apr. 15, 1981, Ser. No. 254,283

Claims priority, application United Kingdom, Apr. 15, 1980, 8012337; May 19, 1980, 8016499

Int. Cl.[4] B65G *47/26*

U.S. Cl. 198—457 **7 Claims**



1. Apparatus for conveying rod-like articles, comprising a first conveyor for conveying a first stream of rod-like articles in stack formation at a first level; a second conveyor for conveying a second stream of rod-like articles in stack formation at the first level; a third conveyor for conveying said second stream at the first level; means for transferring the second stream from the second to the third conveyor, including a transfer conveyor having a path which is curved about an axis generally transverse to the articles on said conveyor and to their direction of conveyance; a junction between said first and third conveyors, a fourth conveyor for moving the first and second streams combined away from the junction at a second level; and means including stationary support surfaces for supporting said second stream between said second conveyor and said transfer conveyor and between said transfer conveyor and said third conveyor; wherein at least one of said surfaces has a transition with said transfer conveyor adapted to engage articles at an asymmetric position to aid transfer to or from the transfer conveyor.

4,572,353

REVERSIBLE STOW CONVEYOR TRACK

Christian Felder, Dreieichenhain, Fed. Rep. of Germany, assignor to Gebhardt Fordertechnik GmbH, Fed. Rep. of Germany

Filed Jan. 25, 1983, Ser. No. 461,139

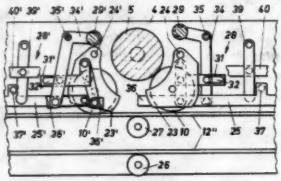
Claims priority, application Fed. Rep. of Germany, Jan. 26, 1982, 3202382

Int. Cl.[4] B65G *37/00*

U.S. Cl. 198—577 **7 Claims**

1. A reversible stow conveyor system for continuous conveying and stowing of unit loads having a conveyor means arranged between longitudinal frames and divided into sections, each section being driven by at least one intermediate roller which is driven by a rotating driving means, wherein said intermediate roller of each section is connected by a control linkage to a sensor which can be actuated by the unit load and can be switched from a drive position to a neutral position, characterized in that

each section of the conveyor means has at least two intermediate rollers which act upon the conveyor means in oppo-



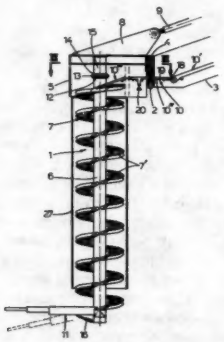
site directions of conveyance, wherein one intermediate roller always assumes the drive position.

4,572,354

CONVEYING APPARATUS

Berend Jan ter Bals, Zaandam, Netherlands, assignor to Weimar N.V., Curacao, Netherlands Antilles

Filed May 2, 1984, Ser. No. 606,181
Claims priority, application Belgium, May 11, 1983, 210747
Int. Cl.[4] B65G *21/10*
U.S. Cl. 198—592 **12 Claims**



1. A conveying apparatus in particular for loading and unloading ships, comprising:

a helical conveyor for transport along a helical path which helical conveyor is rotatable through at least 360 degrees about a centerline of a substantially vertical central shaft;

a lower discharge and feed conveyor; and

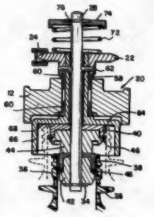
an upper feed and discharge conveyor comprising a main portion, an extendible intermediate conveyor, an end conveyor and mounting means for mounting said end conveyor; the intermediate conveyor interconnecting the main portion to the end conveyor and being connected on one side to the main portion and being pivotable about a first substantially horizontal axis with respect thereto; the immediate conveyor being connected on another side to the end conveyor and being pivotable about a second substantially horizontal axis with respect thereto; the end conveyor having a free end adjacent the helical conveyor; said mounting means permitting said end conveyor to be translatable only in a substantially vertical direction to maintain a substantially constant angle between said end conveyor and said endless conveyor.

4,572,355

COUPLING ASSEMBLY

Burnis L. Hunter, Mableton, Ga., assignor to Sewell Plastics, Inc., Atlanta, Ga.

Filed Oct. 3, 1984, Ser. No. 657,135
Int. Cl.[4] B65G *25/00*
U.S. Cl. 198—803.12 **10 Claims**



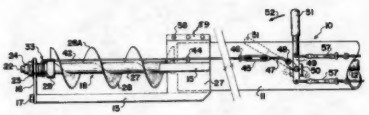
1. A coupling assembly for a conveyor used in conjunction with blow molding apparatus and adapted to engage parisons of a plurality of preselected sizes, the conveyor including a plurality of carriers of coupling assemblies, each coupling assembly comprising: an elongated member passing through a carrier, and a plurality of parison engaging means supported with respect to one end of the elongated member in axially displaced relation to each other, each parison engaging means being dimensioned differently from the other parison engaging means situated on the elongated member to engage a parison of a preselected size.

4,572,356

SAFETY CLUTCH AND QUICK RELEASE ASSEMBLY FOR GRAIN AUGERS AND THE LIKE

Harry G. Janick, Box 27, Roland, Canada (R0G 1T0)

Filed Jun. 23, 1983, Ser. No. 506,908
Int. Cl.[4] B65G *33/32*
U.S. Cl. 198—667 **11 Claims**



1. An auger assembly comprising in combination an auger tube, an auger flight on a main auger shaft journalled for rotation in said tube and having an intake end and a discharge end, a safety clutch and quick release assembly therefore, an intake end auger shaft portion extending from and rotatable with the main auger shaft, means to support the distal end of said intake end auger shaft portion, an intake flighting component, a tubular shaft portion around which said flighting component is mounted and secured, said tubular shaft portion being mounted for free rotation upon said intake end auger shaft portion, a clutch assembly selectively and operatively connectable between said tubular shaft portion and said intake end auger shaft portion and actuating means including an operating lever to selectively end shift tubular shaft portion relative to said intake end auger shaft portion from a clutch engaging position to a clutch disengaging position and vice versa, and a further actuating means adjacent the discharge of said auger assembly operatively connected to said tubular shaft portion, said further actuating means including a double ended lever pivoted intermediate the ends thereof to said auger tubing adjacent the discharge end thereof and adjustable linkage means extending from adjacent each end of said double ended lever to said operating lever one upon each side of the point of pivotal connection of said operating lever to said grain auger tube,

movement of said double ended lever moving said operating lever.

4,572,357

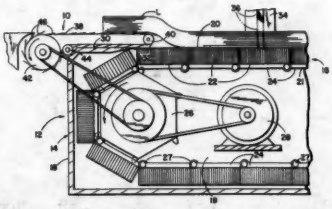
SHEET MATERIAL CONVEYOR WITH UNLOADING APPARATUS

David R. Pearl, West Hartford, Conn., assignor to Gerber Garment Technology, Inc., South Windsor, Conn.

Filed Jan. 26, 1984, Ser. No. 574,288

Int. Cl.⁴ B65G *15/42*

U.S. Cl. 198—693 **14 Claims**



1. Apparatus for unloading material from a material conveyor having a penetrable material support surface defined by the free ends of a multiplicity of spaced apart bristles, and means for driving the material conveyor to move material supported on the support surface to a discharge end of the material conveyor, said unloading apparatus comprising an unloading conveyor having a substantially planar surface portion and an arcuate return portion disposed proximate the discharge end of said material conveyor is generally overalping relation with an associated portion of said discharge end and in the path of the material supported thereon, said unloading conveyor carrying a multiplicity of material lifting elements, means securing said lifting elements to said unloading conveyor for movement with said unloading conveyor and relative thereto, said lifting elements associated with said planar surface portion being disposed generally adjacent said planar surface portion and extending in the direction of said planar surface, said elements associated with said arcuate return portion assuming positions generally tangent to said return portion, and means for driving the unloading conveyor to move the material lifting elements in combing relation to said bristles and the discharge end portion of said material support surface defined by said bristles.

4,572,358

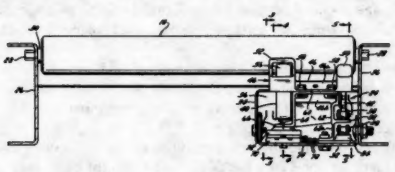
POWERED TRANSMISSION ASSEMBLY FOR AN ACCUMULATING CONVEYOR

Ronald R. Swain, Danville, Ky., assignor to Rexnord Inc., Brookfield, Wis.

Continuation of Ser. No. 242,493, Mar. 10, 1981, abandoned. This application Feb. 6, 1984, Ser. No. 576,993

Int. Cl.⁴ B65G *13/06*

U.S. Cl. 198—781 **12 Claims**



1. An accumulating roller conveyor comprising

(a) a frame;

(b) a plurality of rollers which are rotatably supported by said frame and define a load bearing surface along a longitudinal axis of the conveyor;

(c) a plurality of flexing members having a first portion fixedly secured to said frame and a second movable portion connected to said first portion, said first portion having a thinned region adapted to move in a transverse direction along said rollers and a torsional direction whereby said second movable portion moves in a horizontal direction along the longitudinal axis of the conveyor;

(d) a plurality of driving members rotatably mounted on said flexing members, said flexing members biased in a first position with said respective driving members disengaged from said rollers and flexible in both a substantially vertical direction to move said driving members toward said rollers and a substantially horizontal direction to move said driving members along the longitudinal axis of the conveyor to a second position with said respective driving members engaged with said rollers;

(e) an endless member in driving engagement with said driving members; and

(f) control means contacting said second movable portion of said flexing members for flexing said flexing member between said first and second positions in which said driving members are in disengagement with said rollers and drivingly engage said rollers.

4,572,359

CONVEYOR BELT

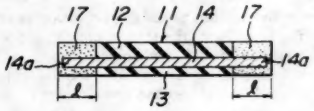
Mamoru Fujita, Ayase, and Yasuaki Kameta, Yokohama, both of Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan

Filed Mar. 29, 1984, Ser. No. 594,614

Claims priority, application Japan, Apr. 11, 1983, 58-52580[U]

Int. Cl.⁴ B65G *15/08*

U.S. Cl. 198—819 **5 Claims**



1. A conveyor belt comprising; an upper covering rubber layer, a lower covering rubber layer, a core layer embedded between the upper and lower covering layers and adapted for use in conveyance while being elastically deformed in a substantially cylindrical shape to overlap surfaces of the widthwise edge portions thereof with each other and a low friction layer provided at least on each of surfaces the widthwise edge portions of the conveyor belt that overlap with each other.

4,572,360

HERB PACKAGE

Helga Lischka, geb. Woitzik, Post Ponholz, 8414 Brücklhof, Fed. Rep. of Germany

Filed Jul. 25, 1985, Ser. No. 758,813

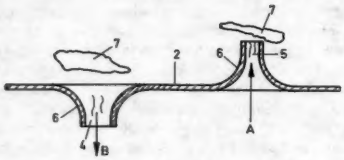
Claims priority, application Fed. Rep. of Germany, Aug. 10, 1984, 8423841[U]

Int. Cl.⁴ B65D *33/01*

U.S. Cl. 206—0.5 **3 Claims**

1. A herb package comprising a pouch defining an inside space for the reception of the herbs, said pouch being made of synthetic foil, said foil having a multiplicity of openings, the synthetic foil forming around each opening a protrusion defin-

ing said opening and projecting beyond one surface of the synthetic foil, a portion of said protrusions projecting outward



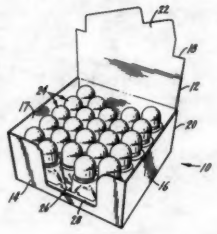
beyond the outside surface of the pouch the remainder of said protrusions projecting into the inside space of the pouch.

4,572,361

DISPLAY SYSTEM FOR CONSUMER FLUID PRODUCT CONTAINERS

Enrique B. Fontilladosa, Barcelona, Spain, assignor to Uniconfis Corporation, Atlanta, Ga.

Filed Aug. 9, 1984, Ser. No. 639,369
Int. Cl.[4] B65D *1/36, 5/44*
U.S. Cl. 206—45.19 **6 Claims**



6. A system for the storage and display of containers holding consumer fluid products, the system comprising a carton, a tray and a plurality of fluid containers,

said containers having a generally tubular configuration with one cylindrical end and one flat end,

said tray comprising a plurality of troughs of a V-shaped configuration defined by forward and rearward walls joined by a floor means,

at least some of said troughs divided into a plurality of pockets, each pocket receiving the flat end of said containers,

each of said troughs are of sufficient depth to support a container in a substantially upright position,

said troughs are positioned in parallel rows,

the arrangement of said pockets in said troughs are skewed so that the containers in one row will not be aligned with the containers in any adjacent row, but will be substantially aligned with the containers in any alternate row,

the cylindrical end of said containers having a diameter substantially equivalent to the distance between the centers of two alternate troughs,

said tray having generally parallel sides at right angles to the troughs, at least some troughs approaching in length the distance between two parallel sides, the tray being adapted to be received inside of the carton,

the carton being roughly the same height as a container and having a top and front portion adapted to be uncovered from the contents of the carton and turned into a display board,

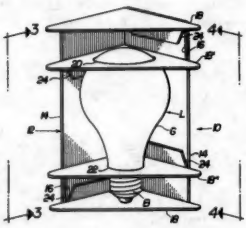
the structure of the configuration of the containers resulting in close packing, mutual support and fixed display, the containers being in display position upon opening of the carton.

4,572,362

LIGHT BULB PACKAGE

Marcie Kronfeld, 1989 NE. 119 Road, North Miami, Fla. 33181

Filed Jul. 13, 1984, Ser. No. 630,718
Int. Cl.[4] B65D *85/42*
U.S. Cl. 206—45.14 **7 Claims**



1. A package for protectively displaying a light bulb and like article therein, said package comprising:

(a) a one-piece precut sheet of relatively rigid yet flexible material including two center panels each being substantially equivalently dimensioned and having a rectangular configuration, said two center panels being foldably attached along a weakened fold line integrally secured to commonly disposed longitudinal edges of each center panel,

(b) said sheet further comprising four substantially triangular panels including a first two triangular panels each foldably connected directly to an oppositely disposed longitudinal end of different ones of said center panels, and a second two triangular panels each movably interconnected to an oppositely disposed longitudinal end of different ones of said center panels,

(c) a positioning panel foldably attached to each of said two second triangular panels and to said respective longitudinal ends of said center panel and disposed to interconnect and properly position said respective second triangular panels and said center panel to one another,

(d) each of said second triangular panels being apertured to accommodate passage therethrough of a portion of the light bulb being displayed,

(e) each of said four triangular panels including a mounting tab foldably connected to a substantially commonly positioned perpendicular edge thereof, said mounting tab cooperatively positioned and structured relative to said four triangular panels and said center panels so as to dispose said four triangular panels in a substantially parallel, spaced apart relation to one another when said package is assembled,

(f) said assembled package defined by a first and a second peripheral edge of each triangular panel transversely disposed in engagement with different ones of said center panels said first and said second peripheral edge being dimensioned to extend beyond said respective center panels,

(g) a third peripheral edge of each of said triangular panels being disposed outwardly from said center panels and beyond a plane defined by the outermost longitudinal edges of each center panel,

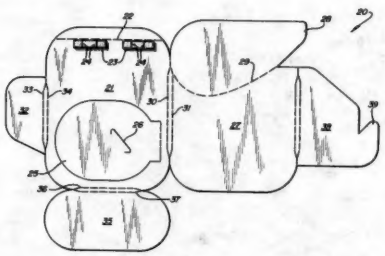
(h) said package further structured to include, when assembled, an open face for display of the light bulb, said open face defined by said outwardly disposed third peripheral edge of said triangular panels and said outermost longitudinal edges of said center panels being unattached to a remainder of said package.

4,572,363

SUTURE RETAINER FOR MULTISTRAND SUTURES WITH SINGLE STRAND SUTURE DISPENSING

Marvin Alpern, Glen Ridge, N.J., assignor to Ethicon, Inc., Somerville, N.J.

Filed Jul. 10, 1985, Ser. No. 753,731
Int. Cl.[4] A61L 15/00
U.S. Cl. 206—63.3 12 Claims



1. A suture retainer for multiple sutures and providing for single strand delivery of a suture from said retainer, said retainer comprising a jacket member for totally enclosing said sutures and at least one insert member disposed within the jacket member and providing a plurality of compartments for individual sutures, said jacket member comprising a first panel, said first panel having a deflectable portion disposed in said panel, said deflectable portion being foldably away from said first panel to provide an opening in said first panel, a second panel foldably connected to said fist panel along one edge thereof, said second panel being substantially coextensive with said first panel when said second panel is folded on said first panel, a third panel foldably connected to the edge of said first panel opposite the edge to which the second panel is foldably connected, said third panel being of the size to at leat partially cover the deflectable portion when said third panel is folded on said first panel, a fourth panel foldably connected along another edge of said first panel, said fourth panel being of a size to at least partially cover the deflectable portion of said first panel when said fourth panel is folded on said first panel, a fifth panel foldably connected to the edge of said second panel opposite the edge of said second panel foldably connected to said first panel, said fifth panel adapted to interlock with the first panel when the fifth panel is folded about said first panel, said insert comprising a member disposed between the first and second panels when said panels are folded one upon the other, said insert member being large enough to cover the deflectable portion of said first panel and said insert member having a plurality of openings disposed in said member in a manner so that said openings are disposed within the opening formed by the deflectable portion of the first panel.

4,572,364

CLOTHES DRYING GARMENT BAG

William T. Jordan, 42932 Via Valparaiso, Fremont, Calif. 94538

Filed Jul. 18, 1984, Ser. No. 632,028
Int. Cl.[4] B65D 85/18; F26B 13/00
U.S. Cl. 206—287 6 Claims

1. A garment bag suitable for use as a portable clothes dryer comprising:

a. two side panels made of flexible, foldable material, one of said side panels having an opening for the insertion of garments,

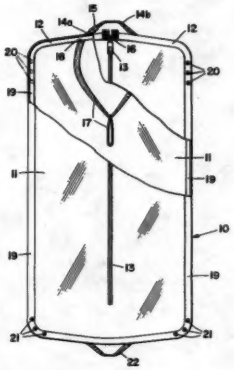
b. a top gusset connected between the top portions of said side panels, said top gusset being made of flexible, foldable material,

c. a top flexible handle attached at spaced locations in the top of said garment bag,

d. an elasticized opening in the central portion of said top gusset and between the areas of attachment of said top carrying handle, said elasticized opening having an expandable opening size to receive the air discharge portion of a portable blower-type hair dryer,

e. hanging means within said bag to suspend a hanger for clothing,

f. a plurality of upper vents in said bag located above the lower portion of said hanging means, and



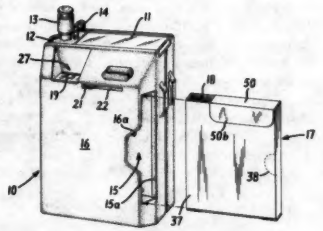
g. a bottom vent in said bag, positioned to drain water from the bottom of said bag, whereby air introduced into said elasticized opening from a hair dryer flows downwardly as a compact stream, reverses direction and flows upwardly as a turbulent stream inflating said bag and exiting through said upper vents.

4,572,365

PROBE COVER HOLDING AND DISPENSING ARRANGEMENT FOR ELECTRONIC THERMOMETER

Robert H. Bruno, Avon; Robert G. Johns, Torrington; Stuart Kipperman, Easton; Geoffrey R. Mayer, Trumbull; Donald E. Protzmann, Litchfield, and Robert F. Uhl, Cheshire, all of Conn., assignors to Chesebrough-Pond's Inc., Greenwich, Conn.

Filed Apr. 3, 1985, Ser. No. 719,369
Int. Cl.[4] B65D 85/08, 83/02
U.S. Cl. 206—306 6 Claims



1. Probe cover holding and dispensing apparatus for an electronic thermometer including a probe, comprising a chamber in the thermometer housing, a carton holding a plurality of probe covers adapted to fit into the housing chamber, an aperture in the chamber, and some of the probe covers in the carton visible through the aperture to enable the probe to be inserted into one of the covers in the carton, whereby the probe when withdrawn from the carton carries the probe cover.

4,572,366

APPARATUS FOR STORING, CARRYING AND SHAKING DOWN A CLINICAL THERMOMETER

Ralph Carson, 6 Banbury La., Commack, N.Y. 11725

Filed Oct. 11, 1984, Ser. No. 659,628
Int. Cl.[4] B65D *85/38*
U.S. Cl. 206—306 **6 Claims**

1. An apparatus for storing, carrying and shaking down a clinical thermometer, said apparatus comprising:

a generally tubular base member having a closed bottom end and an open top end, said base member including an array of external threads disposed adjacent the top end thereof;

a generally tubular shock absorbing collar disposed within said base member adjacent the top end thereof, said shock absorbing collar including a plurality of inwardly directed spring fingers;

a generally tubular cover member having opposed open bottom and open top ends, said open bottom end including an array of internal threads engaged with the external threads on said base member, said cover member further including an annular inwardly directed shoulder intermediate said top and bottom ends thereof, said shoulder defining a generally axially aligned aperture in said cover member;

an elastic cord extending through said aperture in said cover, said elastic cord including means disposed intermediate said shoulder and the bottom end of said cover member for preventing complete passage of said elastic cord through said aperture;

a generally tubular elastic retention member including opposed top and bottom ends, said bottom end of said elastic retention member being slideably and removably disposed in the top end of said cover member, said top end of said elastic retention member including a V-shaped elastic retention slot, said elastic cord extending through said elastic retention member and being engaged in said elastic retention slot such that one end of said elastic cord is disposed external to said elastic retention member, and said elastic retention member further including an annular inwardly extending groove intermediate the bottom end thereof and the slot; and

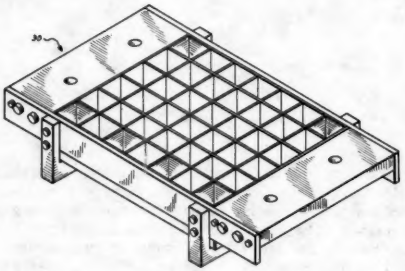
a generally cylindrical cap having opposed inner and outer surfaces, a closed top end and an open bottom end, the internal surface of said cap including an inwardly extending annular ridge adjacent the bottom end of said cap, said ridge being frictionally engaged in the annular groove of said elastic retention member, said cap further including an axially aligned frusto-conical support extending from the closed top end toward the opened bottom end thereof, said frusto-conical support and said inner surface of said cap securely engaging said elastic cord both internal and external to said elastic retention member, whereby said elastic cord biases said elastic retention member into said tubular cover and whereby said elastic cord enables said base and said cover to be rotated about said elastic retention member and said cap to shake down the clinical thermometer.

4,572,367

APPARATUS FOR SHIPPING NAIL HEAD LEADS AND LOADING THE SAME INTO A MANUFACTURING FIXTURE

George C. Uslar, Fawn Hill Dr., Box 212, New Vernon, N.J. 07976

Filed Mar. 17, 1982, Ser. No. 358,895
Int. Cl.[4] B65D *73/02, 85/42*
U.S. Cl. 206—328 **7 Claims**



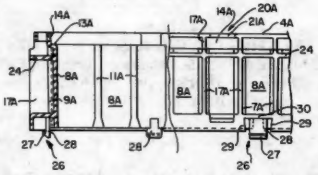
1. A component for a loading fixture comprising a rigid frame surrounding an open space containing a compartmented tray adapted to receive a plurality of electrical leads, said frame having locating means thereon for positioning said frame, and the compartments of said tray, in a predetermined location relative to the holes of a transfer plate with which said frame and said tray are to be assembled, said tray being removably retained in said space so that the frame and tray may be handled as a unit and means for attaching said frame and said tray as a unit to a transfer plate having a plurality of holes therein for receiving electrical leads from the compartments of said tray.

4,572,368

TOTE BOX

Daniel R. Miller, and Albert J. McGlasson, both of Cincinnati, Ohio, assignors to Buckhorn Material Handling Group, Inc., Milford, Ohio

Filed Jul. 18, 1985, Ser. No. 756,316
Int. Cl.[4] B65D *73/02, 6/34*
U.S. Cl. 206—328 **20 Claims**



1. A modular box system, comprising:

a base box constructed in one piece of molded synthetic resin, having a bottom, opposed sides sloping upwardly and outwardly from said bottom, opposed ends sloping upwardly and outwardly from said bottom, and said ends respectively connected at side edges to corresponding side

edges of said sides to form an open top box that may be nested within like open topped boxes;

a molded synthetic resin ring, separate from said base box, having opposed side walls and opposed end walls connected at their side edges to corresponding side edges of said side walls to be of a size and shape so that when placed in alignment on top of said base box, the ring side walls and end walls will form substantially coplanar extensions of the corresponding base box sides and ends;

interlocking elements respectively on the lower edge of said ring in the upper edge of said base box for interconnecting said ring and base box securely; and

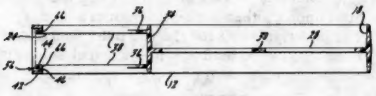
said interlocking elements on one of said base box and ring, comprising opposed pairs of hooks spaced apart from each other in a direction perpendicular to their wall a distance sufficient to receive therebetween the interlocking elements of the other of said base box and ring.

4,572,369

THEFT RESISTANT CASSETTE HOLDER

William L. Morris, Troy, Mich., assignor to Handleman Company, Clawson, Mich.

Filed Apr. 9, 1984, Ser. No. 598,024
Int. Cl.⁴ B65D *85/672*
U.S. Cl. 206—387 **7 Claims**



1. A theft resistant holder for a cassette tape assembly which, after assembly, must be detroyed to enable removal of said cassette tape assembly comprising;

a rectangular unitary body defining a longitudinal axis and a lateral axis, said body having a perimeter flange extending perpendicular to both of said axes forming side walls and an end wall, said body having a partition extending between said side walls to define a handle portion and a cassette tape holding portion arranged along said longitudinal axis, said handle portion having internal web means reinforcing said handle portion, the end portion of said cassette tape holding portion longitudinally opposite said end wall of said handle portion forming an end aperture adapted for receiving said cassette tape assembly when said cassette tape assembly is inserted in the direction of said longitudinal axis, said cassette tape holding portion defining a cavity which closely receives and retains said cassette tape assembly, said end aperture including two pairs of parallel plates bordering said end aperture, said plates forming longitudinally opening slots, and

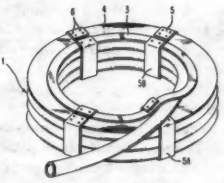
a rectangular endpiece separate from said body and attachable thereto to enclose said end aperture thereby trapping said cassette assembly therein such that destruction of said holder is required in order to remove said cassette tape assembly, said endpiece having a plurality of hooks which interlock with said cassette tape holding portion when inserted within said slots so as to be nonremovable.

4,572,370

PACKAGE FOR COILED PRODUCTS AND METHOD OF PRODUCTION THEREOF

Björn Cedenblad, Ligustervägen 11, and Hans Alexandersson, Kaprifolvägen 5, both of S-513 00 Fristad, Sweden

PCT No. PCT/SE84/00024, § 371 Date Sep. 21, 1984, § 102(e) Date Sep. 21, 1984, PCT Pub. No. WO84/02893, PCT Pub. Date Aug. 2, 1984
PCT Filed Jan. 26, 1984, Ser. No. 662,412
Claims priority, application Sweden, Jan. 26, 1983, 8300383
Int. Cl.⁴ B65D *85/60*
U.S. Cl. 206—398 **16 Claims**



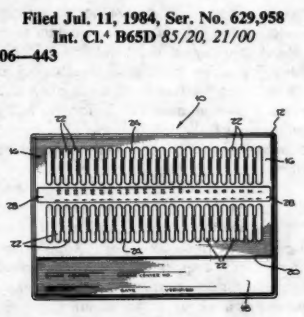
1. A package for products to be coiled, such as ropes, hoses, cables, flexible tubing, or similar products which are avaliable by the yard coiled into a ring-shaped bundle comprising a supporting carrying member disposed on one side of said ring-shaped bundle having two juxtaposed, essentially concentrically disposed annular supporting members, the outside diameter of one of the annular supporting members exceeding the inside diameter of the other annular supporting member, such that the two annular supporting members are connected with one another in at least three points along the periphery of said annular supporting members by means of a flexible member, said flexible members being partly clamped to one annular supporting member, and partly to the other annular supporting member and surrounding between said clamping points the peripheral cross section of the ring-shaped bundle, one of the two annular supporting members being disposed to allow sufficient movement in relation to the other annular supporting member substantially perpendicular to the level of said members whereby flexible tubing or the like included in the ring-shaped bundle can be passed between the two annular supporting members over one and under the other supporting member, or inversely.

4,572,371

PLASTIC HOLDING TRAY FOR LIQUID SAMPLE TUBES

Donald J. Asenbauer, 29933 Louis Ave., Canyon Country, Calif. 91351

Filed Jul. 11, 1984, Ser. No. 629,958
Int. Cl.⁴ B65D *85/20, 21/00*
U.S. Cl. 206—443 **1 Claim**



1. A stackable or nestable fluid sample organizer for organiz-

ing and releasably retaining individual fluid samples in individual plastic collection tubes, which comprises:

a member defining a sample plane;

at least two columns of sample retaining promontories having pairwise symmetry on said sample plane;

sample retaining spaces defined by each pair of pairwise symmetrical sample retaining promontories;

a member defining a numerical plane, coplanar with said sample plane and having ordered numerals thereon for identifying and thereby identifying each of said sample retaining spaces;

at least one longitudinally extending, laterally projecting lip on each of said sample retaining promontories for frictionally retaining sample tubes in said sample retaining spaces;

a member defining an identification plane, coplanar with said sample plane;

a lengthwise step separating said identification plane from said sample plane;

a stacking step peripherally enclosing said sample plane, said numeral plane and said identification plane; and

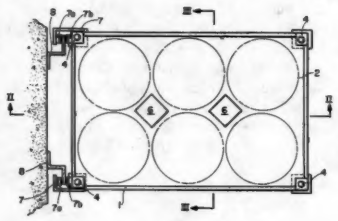
a peripheral ledge forming a base for said stacking step.

4,572,372

RADIOACTIVE WASTE MULTIPLE CONTAINER SYSTEM

Ronald J. Smith, Shillington; L. David Garman, Kutztown, and W. Evans Reynolds, Reinholds, all of Pa., assignors to Gilbert Associates, Inc., Reading, Pa.

Filed Jul. 12, 1982, Ser. No. 397,552
Int. Cl.⁴ B65D *21/02, 25/10*
U.S. Cl. 206—511 **2 Claims**



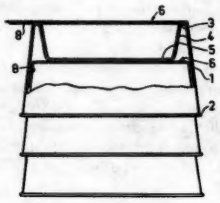
1. In a system for handling and storing radioactive waste, a rectangular metallic container with an open top for containing a plurality of drums, drum stabilizers in the form of hollow metallic posts of substantially square horizontal cross-section rigidly mounted on the bottom of said container and extending upwardly about midway of the height of said container in spaced relationship along the central longitudinal axis of said container adjacent each of said drums to prevent drum toppling or sliding, alignment means in the form of ball and socket joints extending upwardly and downwardly, respectively, at the four corners of said container to facilitate stacking, a pair of vertical rail means comprising flanges of L shape fixed to a stationary vertical wall, and a pair of guide means extending horizontally outwardly from two adjacent corners of said container for cooperating with said vertical rail means to facilitate stacking with lateral stationary wall support, each of said guide means comprising upper and lower cam shaped guides in vertical alignment for contacting one surface of said flanges of L shape and a central channel with an inner cam shaped liner for contacting the opposite surface of said flanges, whereby containers may be vertically stacked with increased stack stability from support of said vertical wall.

4,572,373

MEDICINE CUP

Jan-Erik Johansson, Räfsta, S-186 00 Vallentuna, Sweden

Filed Apr. 18, 1984, Ser. No. 601,767
Claims priority, application Sweden, Apr. 22, 1983, 8302292
Int. Cl.⁴ B65D *21/02, 21/04*
U.S. Cl. 206—515 **6 Claims**



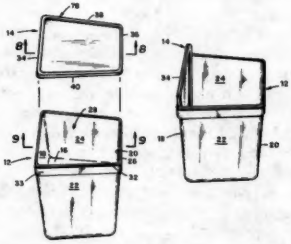
1. A pileable medicine cup, particularly intended to be used for portioning medicine in a solid state, comprising an outer wall having a cross section which conically decreases from a bottom edge towards a top edge, said bottom edge surrounding an open bottom; an inner wall integral with said outer wall at said top edge, said inner wall being located within said outer wall and having a cross section which conically decreases from said top edge towards said open bottom, said inner wall merging into a closed bottom which is spaced from said open bottom by a distance that is at least one-half the total distance between said top edge and said open bottom, said closed bottom being substantially parallel to the plane of said open bottom; and a lid adhesively but removeably abutting said top edge; said inner wall, said closed bottom and said lid defining a closed space for medicine, and the spacing between said closed bottom and said lid being so related to the conical angle of said outer wall that when a plurality of said medicine cups are piled one upon another, the closed bottom of one cup abuts the lid of an underlying cup and the said outer wall of said one cup below its said closed bottom is positioned closely adjacent and parallel to the outer wall of said underlying cup.

4,572,374

CONTAINER

Karl M. Sirotkin, 307 Colonial Rd., Knoxville, Tenn. 37920

Filed Aug. 21, 1984, Ser. No. 642,786
Int. Cl.⁴ B65D *21/02, 21/06*
U.S. Cl. 206—518 **6 Claims**



1. In combination, a nesting open-topped container and lid, said lid being generally planar and having edges which generally define a trapezoid having long and short generally parallel opposed sides and two converging opposed sides, said open-topped container having a rim proportioned to engage said lid which generally defines a trapezoid having long and short generally parallel opposed sides and two converging opposed

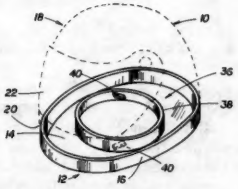
sides, a bottom, and four generally planar walls being interconnected to one another, the upper ends of said walls defining said rim, the distance between the long and short parallel sides of said lid and the distance between the long and short parallel sides of said rim being not substantially greater than the depth of said container from said rim to said bottom, said walls of said container converging inwardly from said rim to said bottom with a degree of convergence sufficient to permit said container to nest within a similarly shaped container, the degree of convergence of said walls which define the opposed converging sides of said rim being such that said lid is insertable into said container along and against the wall which defines the long parallel side of said rim with said short parallel side of said lid being adjacent to said bottom of said container, whereby, a plurality of said containers and lids are stackable in a nested stack with said lids being sandwiched between adjacent walls defining the long parallel side of said rim.

4,572,375

CONTAINER FOR DISPERSANT

Carl D. Baer, 3516 Nanz Ave., Louisville, Ky. 40207

Filed Nov. 26, 1984, Ser. No. 674,779
Int. Cl.[4] A61L 9/04
U.S. Cl. 206—524.1 **12 Claims**



1. A container for a dispersant material, comprising:
a base member;
a cover member having a movable visor therein, said cover member adapted to close over and engage the periphery of the base member;
a generally cylindrically shaped reservoir member adapted to receive therein the dispersant material, the reservoir member having at least one slot formed in its side wall, the slot being open at the base of the reservoir member and extending from the base of the reservoir member in a generally upward and circumferential direction of the reservoir member side wall forming an acute angle between the longitudinal axis of the slot and the base of the reservoir member;
reservoir locating means associated with the container base member for locating the reservoir member on the container base;
reservoir locking means adapted to be received within the at least one slot in the reservoir side wall for holding the reservoir in the location determined by the reservoir locating means;
a reticulated housing adapted to be removably received by the reservoir member; and,
a porous material saturated with dispersant enclosed within the reticulated housing.

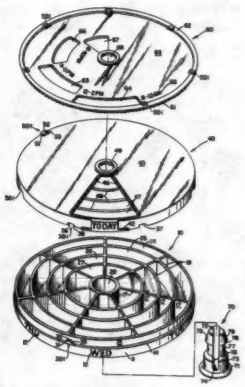
4,572,376

DIAL PILL BOX

Richard K. Wrennall, 74 Cromer Rd., Victoria 3193, Beaumaris, Australia

Continuation-in-part of Ser. No. 418,990, Sep. 16, 1982, abandoned. This application May 31, 1984, Ser. No. 615,742
Int. Cl.[4] B65D 83/04
U.S. Cl. 206—538 **6 Claims**

1. An oral, solid dosage form, pharmaceutical dispenser comprising: a flat, circular container with a transparent walled base having a plurality of arcuate storage compartments arranged within main radial sector storage compartments formed by radial walls and a peripheral wall, all of the arcuate circular segment, storage compartments being formed by sub-dividing the radial walls by annular walls: a lower circular lid and an upper circular lid superposed over the lower lid, each lid having a central hole, the lower lid having a peripheral skirt and a single radial sector storage compartment access opening corresponding in shape and dimension to each main radial sector storage compartment, the upper lid having a plurality of radially and circumferentially spaced arcuate circular segment compartment-access openings corresponding in shape to each respective arcuate circular segment compartment, the peripheral skirt of said lower lid encompassing a portion of the exterior of said peripheral wall of the base; a resilient bifurcated pivot pin for detachably and rotatably clamping the lids onto the container and for removal of the lids from the container to recharge the container with dosages; lower interlocking means comprising means on the exterior of the peripheral wall and fixed with respect to the base for interlocking with complementary shaped means on the lower edge of the peripheral skirt of, and fixed with respect to, the lower lid and rotating only when the said lid is rotated, upper interlocking means comprising means on the upper surface of, and fixed with



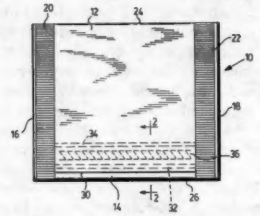
respect to, the lower lid interlocking with complementary shaped means on the lower surface of the upper lid, and fixed with respect to the upper lid and rotated with the upper lid, all of said interlocking means cooperating when the lids are rotated by hand for controlling the rotational direction of the lids with respect to each other and the base and providing dosage interval click stops whereby all compartments may be covered and radial sector storage compartments and arcuate segment storage compartments selectively and successively uncovered and dosage dispensed from the compartments through lid openings, said lower interlocking means allowing said lower lid to be rotated in one direction only with respect to said container and said upper interlocking means allowing said upper lid and said lower lid to be rotated together in said one direction and said upper lid to be rotated by itself in the opposite direction, to close all compartments or selectively open compartments whereby rotation of both said lids in said one direction enables said radial sector compartment access opening of said lower lid to be located above and aligned with one selected radial sector storage compartment of said container and rotation of said upper lid in said other direction enables one of said arcuate access openings to be located above and aligned with one of said correspondingly shaped arcuate storage compartments of said container.

4,572,377

PACKAGING STRUCTURE

Donald E. Beckett, 963 Tennyson Ave., Mississauga, Ontario, Canada (L5H 2Y9)

Filed Jul. 16, 1984, Ser. No. 631,473
Int. Cl.[4] B65D *33/20, 33/34*
U.S. Cl. 206—610 2 Claims



1. A packaging structure of flexible polymeric material, comprising:

a generally rectangular first layer of flexible polymeric material having a top edge, a bottom edge and two side edges,

a generally rectangular second layer of flexible polymeric material overlying said first layer and having a top edge, a bottom edge and two side edges, said side edges of said first layer and of said second layer and said bottom edge of said first layer and of said second layer being joined together to define a cavity between said overlying layers,

said top edge of said first layer being defined by a fold line formed by folding a portion of said first layer over on itself, said folded-over portion having a first face abutting the first layer and a second face abutting one face of the second layer,

a permanent line seal formed between said abutting second face of said folded-over portion and said abutting one face of said second layer adjacent and parallel to said top edge of both said first and second layers,

a resealable line seal parallel to and spaced from said permanent line seal a distance from said top edges greater than that of said permanent line seal from said top edges, said resealable line seal comprising a line of adhesive mounted to said abutting one face of said second layer and releasably bonded to said second face of said folded-over portion, and

a tear strip formed in the second layer parallel to and located between said permanent line seal and said resealable line seal for rupturing the polymeric material between said permanent line seal and said resealable line seal in said second layer, whereby, upon removal of said tear strip said permanent line seal is disabled and said resealable line seal may be opened to permit access to the cavity and reclosed.

4,572,378

SEPARATION METHOD AND APPARATUS

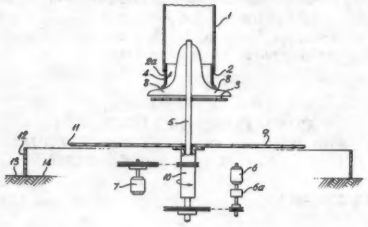
Edward Douglas, Welwyn, and Maurice I. Webb, Stevenage, both of England, assignors to National Research Development Corporation, London, England

Continuation of Ser. No. 398,883, Jul. 16, 1982, abandoned. This application Sep. 24, 1984, Ser. No. 654,043
Claims priority, application United Kingdom, Jul. 17, 1981, 8122078
Int. Cl.[4] B07C *5/34*
U.S. Cl. 209—640 6 Claims

1. Apparatus for separating discrete items of different materials from a mixture by reason of their differential reaction with an unobstructed surface comprising:

a spinning plate having said unobstructed surface and presenting a first circular outer edge and being mounted to rotate about a vertical axis;

a rotary feeder device located vertically higher than said spinning plate, adapted to rotate coaxially with but substantially more slowly than said spinning plate and presenting a second circular outer edge coaxial with but substantially smaller in radius than said first circular edge and to feed said items over said second circular outer edge on to said spinning plate so that they fall freely on to said surface and have substantial vertical velocity but substantially zero horizontal velocity when they make first and bouncing impact with said plate and so that the locus of said first impact with said plate is a continuous curve coaxial with said spinning plate so that each item makes



said first impact with said surface at substantially the same radius;

at least two separate reception zones to receive said items as they subsequently pass outwardly over said first circular outer edge with different paths of movement by reason of their different material; and

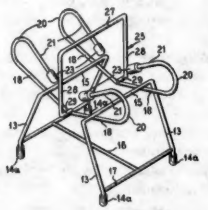
a boundary member adjacent said reception zones, said boundary member being substantially circular and coaxial with said spinning plate, one said adjacent zone lying radially outwards of said boundary member and the other said adjacent zone lying radially inwards of said boundary member.

4,572,379

LARGE CAPACITY DISPLAY STAND FOR PHOTOS AND THE LIKE

William H. Wallo, Clearwater, Fla., assignor to W. H. Wallo & Associates, Inc., Clearwater, Fla.

Filed Jun. 25, 1984, Ser. No. 624,347
Int. Cl.[4] A47F *7/00*; G09F *19/00*
U.S. Cl. 211—57.1 19 Claims



1. A large capacity display stand for graphic material carried by photo sleeves which have header holes therethrough, comprising:

a frame carrying horizontally spaced arm structures each having elongate vertically spaced superposed first and second parts of cross section to fit through said header holes;

sleeve guiding means connecting said parts;

each of said first parts having an end remote from said guiding means and fixedly connected to said frame;

each of said second parts having a free end remote from said connecting means and adjacent to but spaced from said frame so as to facilitate mounting or removing of the photo sleeves relative to said second parts;

stop shoulder means on said free ends of said second parts for retaining the photo sleeves against unintended displacement therefrom;

the photo sleeves being moveable to and from said first and second parts by way of said guiding means for, on one of said parts, being suported in a suspended position and, on the other of said parts, being supported in a generally upstanding position; and

means for resting of the sleeves thereagainst in said generally upstanding position of the sleeves.

4,572,380

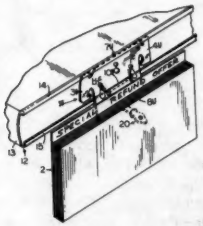
PAD HOLDER ADAPTED FOR MULTIPLE MODES OF MOUNTING AND ASSOCIATED METHODS

John D. Langwell, Freeport, N.Y., assignor to Herman Alexander, Merrick, N.Y.

Continuation-in-part of Ser. No. 402,535, Jul. 28, 1982. This application Jun. 27, 1983, Ser. No. 508,491

Int. Cl.⁴ A47F *7/00*

U.S. Cl. 211—57.1 **36 Claims**



1. A dispenser of sheet items, adapted for being mounted in a U-shaped channel at the edge of a shelf by engaging the flanges of the channel, said dispenser comprising a substantially, flat sheet of flexible material having upper and lower edges, said sheet of material being mountable in a U-shaped channel having upper and lower flanges mounted at the edge of a shelf, the spacing of the upper and lower edges of the sheet being such to enable said edges to engage the flanges of the U-shaped channel to hold said sheet in flexed condition in said channel, and a bendable prong extending downwardly from said sheet beyond said lower edge for movement between a first position in the plane of the sheet and a second position projecting from the plane of said sheet, said prong including a stem and a head, said stem having one end integrally and bendably formed to said sheet and an opposite end to which said head is integrally connected, said head having a greater width than said stem and forming laterally extending sides at the juncture therewith, said head tapering in width from said laterally extending sides in a direction away from said stem to a free end of said head such that said prong can support a plurality of sheet items on said stem while said lateral sides retain said sheet items on the prong in front of the plane of said sheet and said sheet items can be removed one by one from the prong.

4,572,381

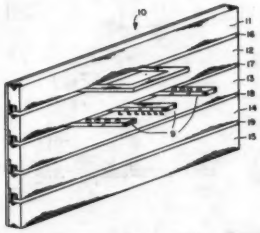
BRACKET BOARD

Fred B. Breakey, 2901 Silver Lake Ave., Tampa, Fla. 33614; Leo D. Barber, P.O. Box 244, Dover, Fla. 33527; Richard L. Chapman, P.O. Box 151028, Tampa, Fla. 33684; Norman Godin, 11906 E. Park Ave., Seffner, Fla. 33584; Robert Henry, Rte. 3, Box 1971, Odessa, Fla. 33556; Claude Jackson, 3201 Granada, Tampa, Fla. 33629; John Romberger, 606 Rosier Rd., Brandon, Fla. 33511, and Rudolph Seidl, 8207 N. Orleans, Tampa, Fla. 33604

Filed Sep. 29, 1982, Ser. No. 427,525

Int. Cl.⁴ A47F *5/08*

U.S. Cl. 211—94 **15 Claims**



1. A bracket board for supporting a bracket, comprising in combination:

a base;

a first and a second facing panel;

means connecting said first and second facing panels to said base for defining a groove therebetween;

a lower edge of said first facing panel having a first undercut;

said first undercut of said first facing panel defining a second undercut disposed adjacent said base;

a reinforcing Z-section member being disposed within said first and second undercuts;

an upper arm of said Z-section member being located between said base and said first facing panel and extending within said second undercut;

a lower arm of said Z-section member extending within said first undercut of said first facing panel and defining a space between said lower arm of said Z-section member and said base; and

said means connecting said first and second facing panel to said base includes mechanical fastening means secured to said first facing panel and said base and extending through said Z-section member for providing a reinforcement to said first undercut when the bracket is inserted through said groove into said space between said lower arm of said Z-section member and said base.

4,572,382

STORAGE AND TRANSPORTATION RACK

Klaus Niederprum, Bergheim, Fed. Rep. of Germany, assignor to Ford Motor Company, Dearborn, Mich.

Filed Sep. 12, 1984, Ser. No. 649,782

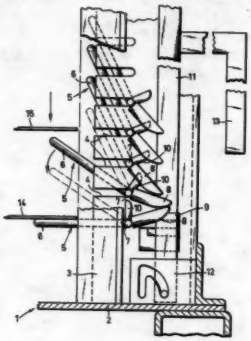
Claims priority, application Fed. Rep. of Germany, Sep. 14, 1983, 3333118

Int. Cl.⁴ A47F *5/00*

U.S. Cl. 211—150 **5 Claims**

1. A storage and transportation rack for stacking and transporting generally flat components, comprising a base, a plurality of support columns extending generally vertically from the base, a plurality of shelves mounted in the support columns for pivotal movement about horizontal axes and arranged closely one above the other, each shelf including a support part, for receiving a flat component, disposed on one side of the pivot axis, and a counterweight and a control arm disposed on the other side of the pivot axis, the arrangement being such that when a component is placed on the support part of a shelf, the

latter is moved from an inclined receiving position into a horizontal supporting position, and during such movement the control arm of the shelf cooperates with the control arm of the shelf immediately above to move the upper shelf from a vertical position in which the shelf is retracted between the support columns to the inclined receiving position, characterized in



that the support parts, the control arms, and the counterweights of the respective shelves are arranged in different vertical planes and in that the shelves are further provided with locking arms arranged in a further vertical plane, the planes being spaced in a direction parallel to the pivot axes of the shelves.

4,572,383

CRANE

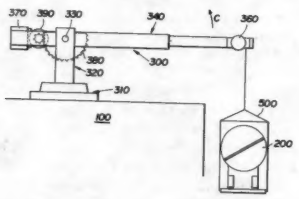
Kei Mori, 3-16-3-501, Kaminoge, Setagaya-ku, Tokyo, Japan

Filed Jul. 12, 1984, Ser. No. 629,939

Claims priority, application Japan, Aug. 19, 1983, 58-151809

Int. Cl.[4] B66C *23/04, 7/00, 5/04, 23/72*

U.S. Cl. 212—264 **4 Claims**



1. A crane for hoisting objects comprising foundation means, a support means extending vertically upwardly from said foundation means, said support means comprising two vertically extending support members spaced from one another, a pair of parallel and spaced arms, pivotal means pivotably mounting said pair of spaced arms on said support means for pivotable movement about a generally horizontal axis, said pivotal means comprising a movable shaft extending between said two spaced support members, said spaced arms being mounted on longitudinal end portions of said movable shaft such that rotation of said movable shaft pivots said spaced arms about the axis of said movable shaft, a driven gear mounted on said movable shaft at an intermediate section of said movable shaft between said spaced arms, said spaced arms having inner terminating end portions which are spaced from one another, a balancing weight mounted on said spaced arms in said space between said inner terminating end portions, a motor mounted on said balancing weight, said motor having a driven gear engageable with said driven gear on said movable shaft for rotating said driven gear to thereby pivot said movable shaft and thereby pivot said arms about said generally horizontal axis, said spaced arms having outer terminating end portions which are spaced from one another, and a winding drum means mounted on said spaced arms in said space between said outer terminating end portions, said winding drum means including means operable to wind and unwind a wire cable to raise and lower a working end of the wire cable such that when the wire cable is wound up on the winding drum to a maximum wind-up position, said working end is located substantially at the longitudinal center of said winding drum so that any object lifted by the wire cable is substantially centrally disposed between said two arms, whereby said crane is capable of lifting and pivoting objects having a transverse dimension substantially equal to the distance between said space arms such that the transverse dimension of said object can be accommodated between said spaced arms as said arms are pivoted about said pivotal means.

4,572,384

CONTAINER WITH CATENARY-FORMED CONTOUR

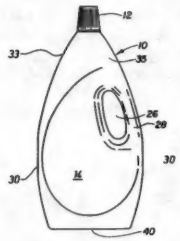
Steen Vesborg, Copenhagen, Denmark, assignor to Colgate-Palmolive Company, New York, N.Y.

Continuation of Ser. No. 528,682, Sep. 1, 1983, abandoned. This application May 3, 1985, Ser. No. 730,395

Claims priority, application Denmark, Sep. 6, 1982, 3974/82

Int. Cl.[4] B65D *1/02*

U.S. Cl. 215—1 C **6 Claims**



1. A container in the form of a bottle or jug for detergent products which is resistant to downward pressures having a body the horizontal section of which describes an ellipse of high order and which narrows towards the top, and at least one part of a vertical section of which through the upright container in a plane through the central axis of the container describes segments of an upper inverted catenary and of a lower catenary interconnected by a rectilinear portion.

4,572,385

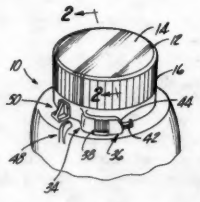
TAMPER INDICATING CHILD RESISTANT THREADED CLOSURE

Edward Luker, Evansville, Ind., assignor to Sunbeam Plastics Corporation, Evansville, Ind.

Filed Apr. 11, 1985, Ser. No. 721,948

Int. Cl.[4] B65D *55/02*

U.S. Cl. 215—216 **13 Claims**



1. A threaded child resistant, tamper indicating closure for

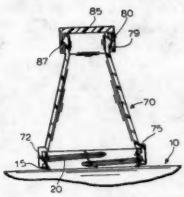
use on a container having a tubular neck with external threads, an annular bead below said threads, and a lock abutment spaced radially outward from said neck with a stop surface lying substantially in a radial plane of said neck, said closure being molded as a one piece cap comprising, in combination: a flat top; an annular skirt depending from said top having internal threads complementary to said container threads; an inwardly projecting flange means at the lower end of said skirt for engagement with said container bead, snapping thereunder as said cap is threaded onto said container; a deflectable tab on said skirt having a portion normally extending radially outward for engagement with said container stop surface when said cap is being unthreaded from said container with said container bead and said flange means in engagement with each other and being movable relative to said stop surface by manual inward deflection thereby permitting said tab to pass said stop surface when said cap is being unthreaded; and a tamper indicating block extending radially outward from said skirt positioned to come into contact with said stop surface to prevent unthreading of said cap until said block is removed from said skirt.

4,572,386

CONTAINER WITH ATTACHABLE SPOUT

Paul Marcus, 85 Pascack Rd., Pearl River, N.Y. 10965

Filed Nov. 2, 1984, Ser. No. 667,621
Int. Cl.[4] B65D *25/48*
U.S. Cl. 215—228 **3 Claims**



1. A plastic container with an upwardly extending integral neck, a conical spout having a base and top, means for connecting the base to the neck, closure means closing the top, said conical spout having a cylindrical annular wall protruding from both the base and the top, said cylindrical annular wall protruding from the base having a bead or thread on its interior wall, said cylindrical annular wall protruding from the top having an integral step in its outer surface equal to the thickness of the wall, said top cylindrical annular wall having an integral circular disc disposed in a plane perpendicular to the axis of the spout located above the step in said cylindrical annular wall.

4,572,387

SCREW-TYPE SAFETY CAP

Edward Luker, and David M. Wright, both of Evansville, Ind., assignors to Sunbeam Plastics Corporation, Evansville, Ind.

Filed Mar. 1, 1985, Ser. No. 707,205
Int. Cl.[4] B65D *41/34*
U.S. Cl. 215—252 **23 Claims**

1. A screw-type safety cap for use on a container having a threaded neck, and outwardly projecting bead below said thread and stop means below said bead, said cap comprising, in combination:

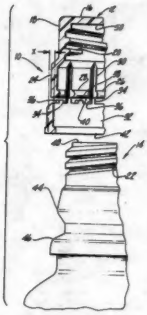
a flat top;

a first cylindrical skirt portion depending from said top having internal threads complimentary to said container threads;

a second cylindrical skirt portion having a larger diameter than said first cylindrical skirt portion and depending therefrom with an inwardly projected bead at its free end;

a tamper indicating band spaced from the bottom of said second cylindrical skirt portion and connected thereto by a plurality of circumferentially spaced axially extending frangible webs, said band having stop means cooperating with the stop means on said container;

whereby as said cap is assembled to a container, said band and container stop means contact each other without fracture of said webs snapping said skirt bead over said container bead;



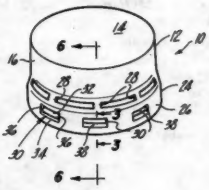
and when said cap is unthreaded from said container, said band and container stop means cooperate to resist relative movement therebetween causing fracture of said frangible webs leaving said tamper indicating band on said container after said cap has been removed.

4,572,388

TAMPER INDICATING SCREW CAP

Edward Luker, and David M. Wright, both of Evansville, Ind., assignors to Sunbeam Plastics Corporation, Evansville, Ind.

Filed Mar. 18, 1985, Ser. No. 713,327
Int. Cl.[4] B65D *41/34*
U.S. Cl. 215—252 **19 Claims**



1. A threaded tamper indicating closure for use on a container having a threaded neck and an outwardly projecting stop means below said thread, said closure being molded as a one piece cap comprising in combination: a flat top; a first annular skirt portion depending from said top having internal threads complementary to said container threads; a second annular skirt portion having a larger diameter than said first cylindrical skirt portion and depending therefrom; a tamper indicating band spaced from the bottom of said second annular skirt portion and connected thereto by a plurality of circumferentially spaced axially extending frangible bridges; a plurality of circumferentially spaced stop segments attached to the lower portion of said band by flexible webs; and a plurality of circumferentially spaced windows formed in said band in line with said stop segments; said flexible webs permitting swinging of said stop segments inwardly and upwardly to individually engage said windows for application of said cap to said container, and upon rotation of said cap in an unthreading direction, the engagement of said stop segments with said container stop means resisting movement of said band causing fracture of

said frangible bridges, leaving said tamper indicating band on said container after said cap has been removed.

4,572,389

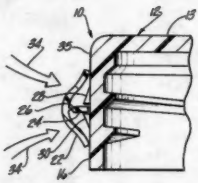
TAMPER INDICATING SCREW CAP WITH SATELLITE RING

Peter P. Gach, Evansville, Ind., assignor to Sunbeam Plastics Corporation, Evansville, Ind.

Filed Nov. 5, 1984, Ser. No. 668,513

Int. Cl.[4] B65D *41/34*

U.S. Cl. 215—253 **17 Claims**



1. A tamper indicating closure for a container having a threaded neck, comprising, in combination:

a cup-shaped cap having an annular side wall with a substantially smooth exterior wall and a threaded interior wall for engaging complementary threads on the neck of said container;

a tamper indicating satellite band circumposing said cap, said band being spaced from and extending over a substantially more than half the height of said cap; and

an annular flange member integrally molded with said band and connected to the exterior of said cap at a mid-point thereof and forming a frangible connection adapted to be broken by finger pressure when the cap is grasped to assert an opening force thereon.

4,572,390

BUNG HOLE CLOSURE FOR CANS

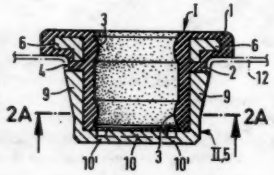
Günter Grittmann, Ringstrasse 6, 7519 Eppingen-Mühlbach, Fed. Rep. of Germany

Filed Nov. 23, 1984, Ser. No. 674,034

Claims priority, application Fed. Rep. of Germany, Dec. 16, 1983, 3345619

Int. Cl.[4] B65D *39/04*

U.S. Cl. 217—106 **4 Claims**



1. A two-part closure for a bung hole in a lid of a can in which a liquid is stored and whence the liquid may be tapped under pressure, the lid having a smooth rim defining the bung hole, which comprises

(a) a soft, plug-like tubular bung bush defining an axial bore for insertion into the bung hole and having

(1) a transverse sealing portion projecting across the bottom of the bore,

(2) a radially outwardly extending annular projection at an outer end of the bung bush and adapted to support the inserted bung bush on the lid and including a smooth seal seat facing axially downwardly from the projection for sealing engagement with the smooth rim when the bung bush is inserted into the bung hole, and

(b) a hard, cage-like sleeve surrounding and reinforcing the soft bung bush, the cage-like sleeve including

(1) respective rings at an outer end and an inner end of the sleeve,

(2) a projection extending radially outwardly from the ring at the outer end and embedded in the annular projection of the soft bung bush for reinforcement thereof,

(3) axially extending webs connecting the rings and defining axially extending perforations therebetween, the webs being embedded completely in the soft bung bush, and

(4) snap catches extending axially and radially outward from the ring at the inner end to free ends of the catches located below the ring at the outer end and below the smooth seal seat, the catches protruding conically in their extension so that they tapen axially and radially outwardly as they extend toward said outer end and being adapted to be pushed radially inwardly by the rim when the closure is inserted in the bung hole and to snap back to protrude below the rim after the closure has been inserted.

4,572,391

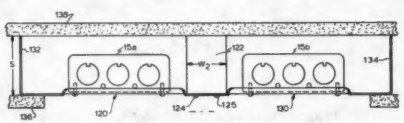
BRACKETS FOR MOUNTING PAIRS OF ELECTRICAL OUTLET BOXES

Lewis B. Medlin, P.O. Box 237, Blue Ridge, Va. 24064

Continuation-in-part of Ser. No. 690,057, Jan. 9, 1985, Pat. No. 4,533,060. This application Jul. 1, 1985, Ser. No. 750,264

Int. Cl.[4] H02G *3/08*

U.S. Cl. 220—3.9 **23 Claims**



1. A plural electrical outlet box mounting assembly, comprising:

(a) a pair of square outlet boxes each having integrally joined base and sidewalls formed with a selected number and size of knock-out discs and on the outer edge of each sidewall of one opposed pair of said sidewalls having a pair of inwardly-directed, laterally-spaced screw receiving tabs with threaded holes and overlying an interior chamber formed by said box with the pair of tabs on one said sidewall opposing and being laterally spaced apart the same distance as the pair of tabs on the opposite said sidewall;

(b) a pair of dry wall rings each having a central opening and a peripheral plate flange with screw clearance openings arranged for being mated to said tab threaded holes;

(c) a pair of mounting brackets, each said bracket comprising an L-shaped unitary mounting bracket formed of a single piece of stiff sheet material, including for each said bracket:

(i) first and second contiguous rectangular plate portions in right angular relation at a first end of said bracket, said first plate portion being sufficiently wide to substantially equal the width of the interior space of the wall on which said bracket is installed to thereby serve as a stiffening member for said bracket; and

(ii) a plate body portion extending outwardly from said second plate portion having:

(aa) at an outer end a third rectangular flat plate end portion in the same plane as the plane of said second plate portion, said third plate end portion being adapted for securement to a selected support such as the front surface of a construction stud, the second

plate portion of another bracket in piggyback relation, or one end surface of an extension plate and having a pair of holes formed therein for receiving a mating pair of fasteners to effect said securement;

(bb) between said third plate portion and second plate portion having a fourth rectangular plate portion in a plane offset from and substantially parallel to the plane of said second and third plate portions by an amount substantially equal to the thickness of a said dry wall ring flange, said fourth plate portion plane being established by parallel offsets formed on both sides of said fourth plate portion;

(cc) a substantially square opening in said fourth plate portion defined by opposed straight parallel upper and lower and opposed straight parallel right and left side edges formed in said fourth plate portion around said opening, said right and left edges being parallel to said offsets and said opening being sized to register with the interior chamber of said box with the width of said opening being substantially equal to the spacing between a tab on one of said sidewalls and the opposite tab on another of said sidewalls;

(dd) a first pair of laterally spaced screw slots extending from the said upper edge of said fourth plate portion opening, said slot lateral spacing being equal to the lateral spacing between the threaded holes in each of said pair of tabs;

(ee) a second pair of laterally spaced screw slots extending from the said lower edge of said fourth plate portion opening, said second pair of slots having a depth compared to the depth of said first pair of slots sufficient for at least limited vertical box mounting adjustment on said bracket and being positioned opposite to said first pair of slots, said lateral spacing between said second pair of slots also being equal to the lateral spacing between the threaded holes in each of said pair of tabs;

(ff) a third pair of laterally spaced screw slots extending from the left edge of said fourth plate portion opening and having a lateral spacing substantially equal to the lateral spacing of said first and second pair of slots;

(gg) a fourth pair of laterally spaced screw slots extending from the right edge of said fourth plate portion opening, said fourth pair of slots being positioned opposite to the position of said third pair of slots and having a lateral spacing equal thereto and a depth compared to the depth of said first, second and third pair of slots enabling horizontal box mounting adjustment on said bracket;

(hh) a flange ring turning surface established by the spacing of said right and left edges of said opening from the said respective offsets on either side thereof and formed such that when a selected screw clearance opening on said dry wall ring rotates around a screw installed in a selected one of said tab threaded holes as another diagonally opposite selected said screw clearance opening is positioned to engage another diagonally opposite screw in another diagonally opposite said tab threaded hole, the bottom surface of said dry wall ring is able to slide on said fourth plate portion; and

(ii) between each pair of slots at the corners of said opening an outwardly curved edge serving as a continuation of the slot edge on either side thereof; and

(d) a plurality of screws adapted for being loosely fitted in said slots and for being secured in said tab threaded holes, whereby when a pair of said brackets extending in opposite directions have the third plate portions thereof secured to the front surface of a construction stud or when a first one of said brackets has the third plate portion thereof secured to the front surface of a construction stud and the second one of said brackets has its third plate portion secured in a piggyback orientation to the second plate portion of the first one of said brackets or when selected said brackets have the third plate portion thereof secured to one end of an extension plate in turn secured to the front surface of a construction stud and fasteners are installed to perfect the securement and an electric outlet box is positioned adjacent the inner side of each said fourth plate portion of each said bracket in position with respect thereto so that the interior of each said respective electric outlet box is accessible through the respective said fourth plate portion opening adjacent thereto and a dry wall ring is fixed to the other side of said fourth plate portion, said first plate portions tend to stiffen said brackets and said slots enable each said outlet box, bracket and dry wall ring to be held in operative position with screws passed through said slots and secured in said tab-threaded holes with said tabs being oriented to mate with selected edges surrounding the respective said opening adjacent the respective said box and whereby the outer surface of the flange of each said ring is maintained when said screws are tightened in substantially the same plane as the outer surface of the respective said second and third plate portions of the respective said brackets on which each respective said ring is mounted.

4,572,392

BOX CONSTRUCTION

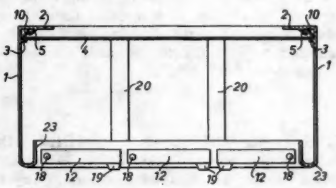
Walter Schneider, Langnau, Switzerland, assignor to W. Schneider & Co. AG, Metallwarenfabrik, Langnau, Switzerland

Filed May 20, 1985, Ser. No. 736,273

Claims priority, application Switzerland, May 29, 1984, 2624/84

Int. Cl.⁴ B65D 7/00

U.S. Cl. 220—4 R **12 Claims**



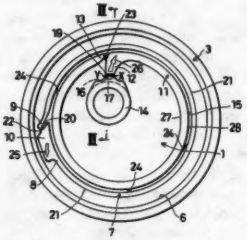
1. In a box construction having four side walls, means joining said four side walls to form a box frame, and a rear wall for closing said box frame at its rear, the improvemcnt comprising a pair of inwardly reaching flanges (**2, 3**) extending along each rear zone of at least two of said four side walls which extend in parallel to each other, said flanges extending in parallel to said rear wall and to each other and at right angles relative to the respective side wall, an inwardly facing spacing between the flanges forming a pair of flanges, one flange of each pair of flanges having an angled flap (**5**) extending alongside the flange toward the respective side wall and toward the respective other flange for forming a recess behind said angled flap (**5**), said angled flap having a free edge (**6**) spaced from the respective other flap so as to leave a gap (**7**) between said free edge of the flap and the respective other flange for providing access into said recess through said gap, said rear wall having an angled rim (**10**) along at least two opposite edges of said rear wall, said angled rim facing toward said one flange having said angled flap, said angled rim (**10**) reaching into said recess for providing an interlocking between said rear wall and said two side walls.

4,572,393

CONTAINER WITH EASY OPEN TYPE CLOSURE

Koji Kobayashi, Iwatsuki, and Keisuke Shimizu, Houya, both of Japan, assignors to Hokkai Can Co., Ltd., Tokyo and Snow Brand Milk Products Co., Ltd., Hokkaido, both of, Japan

Filed Feb. 25, 1985, Ser. No. 704,857
Int. Cl.[4] B65D *41/32*
U.S. Cl. 220—270 8 Claims



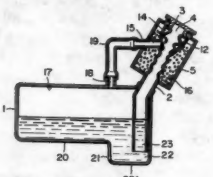
1. An easy open type closure for a container comprising:
a closure member made of at least a metallic foil sheet for being affixed together with a ring-shaped member to an edge of an opening of a container barrel body; and
a first pull-opening member having a first pulling tab connected to an initial end portion thereof and being connected to an upper surface of the closure member more firmly than a tearing strength of the closure member;
a second pull-opening member having a second pulling tab connected to an initial end portion thereof and being connected to an upper surface of the closure member more firmly than a tearing strength of the closure member;
said first pull-opening member being formed of a strip member extending in an annular form along an inner edge of the ring-shaped member and includes a final end portion directed towards the first pulling tab;
said second pull opening member being formed of a strip member that extends in an annular form along an inner side edge of the first pull-opening member and includes a final end portion directed towards the first initial end portion thereof.

4,572,394

FUEL TANK FOR USE IN A MOTOR VEHICLE

Toshio Tanahashi, Susono; Takaaki Ito, Mishima, and Koji Uranishi, Susono, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Japan

Filed Apr. 2, 1985, Ser. No. 719,123
Claims priority, application Japan, Apr. 6, 1984, 59-049577
Int. Cl.[4] F16J *15/10*
U.S. Cl. 220—86 R 10 Claims



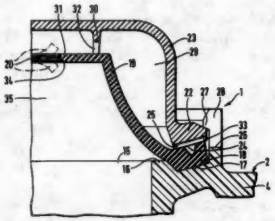
1. A fuel tank for use in a motor vehicle, comprising:
a canister housing located at a fuel inlet position of said fuel tank and having a thick wall at an upper end thereof, said thick wall having a threaded bore formed therein and a flat inner face defining a first valve seat, said canister housing having an activated carbon contained therein;
a fuel inlet pipe connected to said fuel tank and having an upper portion located in said canister housing and aligned with said threaded bore, said upper portion having an upper end portion which is slightly spaced from said first valve seat and has a diameter larger than that of said threaded bore, said upper end portion defining a second valve seat;
a cap removably screwed into said threaded bore; and
a valve body made of a resilient material and arranged in said upper portion of said fuel inlet pipe, said valve body having a lower end portion fixed to an inner wall of said fuel inlet pipe and having an annular flat upper end valve portion which is located between said first valve seat and said second valve seat and cooperating with a lower end portion of said cap for seating said valve portion on said second valve seat when said cap is screwed into said threaded bore and for seating said valve portion on said first valve seat due to the resiliency of said valve body when said cap is unscrewed, said upper portion of said fuel inlet pipe and said valve body defining therebetween a fuel vapor passage which is continuously connected to an interior of said fuel tank and is connected to said canister housing via a clearance formed between said valve portion and said second valve seat when said cap is unscrewed.

4,572,395

SCREW CAP HAVING VENT MEANS

Horst Quitmann, and Dieter Bangert, both of Frankfurt am Main, Fed. Rep. of Germany, assignors to Alfred Teves GmbH, Frankfurt am Main, Fed. Rep. of Germany

Filed Mar. 12, 1985, Ser. No. 710,915
Claims priority, application Fed. Rep. of Germany, Mar. 31, 1984, 3412059
Int. Cl.[4] B65D *51/16*
U.S. Cl. 220—203 9 Claims



1. A screw cap, in particular for use in fluid reservoirs of hydraulic actuating systems, said screw cap having an opening and a pressure-balancing device sealingly surrounding the opening, said pressure-balancing device comprising a protective cover and a port which is configured in the protective cover, wherein said protective cover is surrounded by a guard having a passage, said passage being arranged below said port.

4,572,396

CAP WITH VALVE

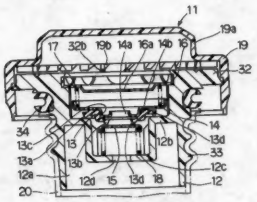
Joji Kasugai; Toru Kuniyoshi, both of Ichinomiya, and Satoshi Toki, Inazawa, all of Japan, assignors to Toyoda Gosei Co., Ltd., Nishikasugai, Japan

Filed May 7, 1985, Ser. No. 731,519
Claims priority, application Japan, May 7, 1984, 59-066879
Int. Cl.[4] B65D *41/04;* F16K *17/18*
U.S. Cl. 220—203 4 Claims

1. A cap with valve comprising:
(a) a cap body having a fluid flow path and a stepped portion provided on the inner circumference of the fluid flow path;
(b) a seal member of ring form disposed in the fluid flow path

of said cap body and provided with lip elements projecting in the same direction at outer and inner peripheries respectively and with an annular groove on the inner perihery at the rear surface side of the outer and inner lip elements, said outer lip element only abutting on the stepped portion of the cap body;

(c) a support plate disposed in the fluid flow path of said cap body and provided with a fluid flowing hole at the center and with a stepped portion to which the annular groove of the seal member is fitted, said annular groove being fitted to said stepped portion so as to fix the seal member, said



seal member being urged to the stepped portion of said cap body;

(d) a valve plate disposed in the fluid flow path of said cap body and abutting on the inner lip element of said seal member and biased to close the inner circumference of said inner lip element; and

(e) a recess formed on at least one of the rear surfaces of said outer and inner lip elements and said support plate so that a gap is produced on the whole circumference of the rear surface of the outer and inner lip elements and the support plate in the non-pressed state of the seal member to the stepped portion of the cap body and the valve plate.

4,572,397

CONTAINER FOR CHEMICALS

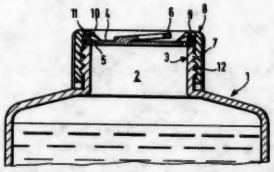
Hans Arens, Wertingen, Fed. Rep. of Germany, assignor to Grunbeck Wasseraufbereitung GmbH, Hochstadt, Fed. Rep. of Germany

Continuation of Ser. No. 477,227, Mar. 21, 1983, abandoned. This application Jan. 28, 1985, Ser. No. 695,737

Claims priority, application Fed. Rep. of Germany, Mar. 24, 1982, 3210819

Int. Cl.⁴ A01G *9/02*

U.S. Cl. 220—270 **16 Claims**



1. Container for chemicals comprising a portion forming an opening for receiving a tube adapted to be entered into the container and leading to a metering pump and a headpiece connectable to the said portion, wherein said headpiece comprises sealing means surrounding the tube to be entered and wherein there is provided an air path passing between said portion and said headpiece, said air path ending in the interior of the container passing between said sealing means and said portion and a filter means connecting said air path with the interior of the container and closing means for closing said opening, said filter means being held between said portion and said headpiece in a position between said portion and said sealing means at the outside of said closing means, whereby said filter means is prevented from contact with the chemicals before opening said closing means for entering said tube.

4,572,398

CLOSURES FOR CONTAINERS

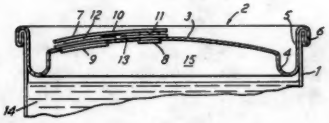
Andrzej J. J. Juty, Kenton, England, assignor to Metal Box p.l.c., Reading, England

Filed Mar. 22, 1985, Ser. No. 714,825

Claims priority, application United Kingdom, May 8, 1984, 8411620

Int. Cl.⁴ B65D *17/34*

U.S. Cl. 220—271 **9 Claims**



1. A closure, for a container of the kind having a pouring aperture and a venting aperture in one end of the container, said closure being moulded in one piece of plastics material and comprising respective annular collar portions adapted to be fitted in an airtight manner within the said apertures, and respective plugs each attached by a rupturable section of the plastics material to the mouth of its annular collar portion to seal the respective aperture, each plug being shaped so that after breaking of the rupturable section to open the aperture the plug can be forced back into the collar portion to re-seal the aperture, the two plugs being connected to one another by a connecting member which is flexibly connected to one of the collar portions so as to retain the plugs after opening of the apertures, wherein the connections between each collar portion and the other parts of the closure are such as to ensure freedom of the collar portions to tilt relative to one another.

4,572,399

PLASTIC CONTAINER HAVING INWARDLY FORMED FLANGE

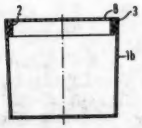
Erik Bock, Ejby Strandvej 3, DK-4070 Kr. Hyllinge, Denmark

Filed Aug. 1, 1984, Ser. No. 636,594

Claims priority, application Denmark, Aug. 9, 1983, 3631/83

Int. Cl.⁴ B65D *39/00*

U.S. Cl. 220—307 **16 Claims**



1. A container made of flexible resilient plastics, said container comprising:

a sidewall;

a rim portion on said sidewall;

a hinged portion joining said rim portion and said sidewall, said hinge portion being of substantially less thickness than said rim portion and said sidewall; said sidewall, rim portion and hinge portion being molded in one piece and so formed that said rim portion can be folded inwardly and held in a position bearing against an inside of said

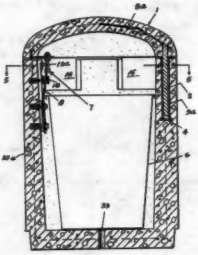
sidewall, said rim portion when folded inwardly projecting inwards from said sidewall.

4,572,400

STORAGE RECEPTACLE

Hector M. Sosa, 7311 SW. 132 Ave., Miami, Fla. 33183

Filed Aug. 31, 1984, Ser. No. 646,108
Int. Cl.[4] B65D *45/28*
U.S. Cl. 220—323 **7 Claims**



1. A storage receptacle comprising, in combination, an open-top container, a closure lid for said container, means pivotally supporting said lid with respect to said container so that it is can be moved sidewardly in cantilevered relation between open and closed positions with respect to said container, and means for releaseably locking said lid in closed position upon said container, said container being cylindrical in shape and said closure lid being circular in shape, said container and said closure lid both being fabricated of formed concrete, said pivotally supporting means comprising a steel shaft embedded in and extending outwardly of the rim of said circular lid, a tubular sleeve imbedded within the rim at the open-top end of said cylindrical container, said shaft being journalled in said sleeve for rotative motion therein, said releaseably locking means comprising a resilient member secured to the inside wall of said container, and a bolt member secured with respect to and extending downwardly and outwardly of the rim of said circular lid, said bolt member having a head portion receivable end and an opening in said resilient member for interlocking said bolt and said resilient member, said resilient member further being formed with opposed, inclined-plane portions, said inclined-plane portions and said bolt head portion being so relatively positioned that when said lid is moved between open and closed positions said bolt head portion will slide against one or the other of said opposed inclined-plane portions to cam said resilient member away from said bolt head member until said bolt head member is received within said opening in said resilient member.

4,572,401

DEVICE FOR SAFELY HOLDING IN POSITION A RAISED OR LOWERED FLAP

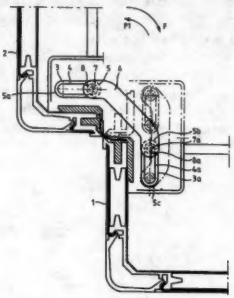
Jean Grenier, Pantin, France, assignor to Louis Vuitton, S.A., Paris, France

Filed Sep. 12, 1983, Ser. No. 531,908
Claims priority, application France, Sep. 14, 1982, 82 15482
Int. Cl.[4] H05B *3/02*; E05C *17/20*
U.S. Cl. 220—335 **5 Claims**

1. An improved device with a double function of holding a flap in position and of providing safety when said flap is raised and lowered, comprising:

a two-portion box, each portion being designed so as to be securable to a corresponding element of a hingedly-joined assembly, each of said portions containing therein an oblong groove having walls of a determined elasticity, each of said oblong grooves including a zone of a smaller cross-section proximate one end thereof; and,

a part provided at each of its two ends with a lug, each lug being caught between said walls of one of said grooves,



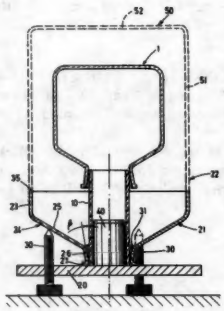
said lugs being capable of translatable and rotational movement within said grooves.

4,572,402

CONTAINER HAVING A HIGH DEGREE OF THERMAL INSULATION

Pierre P. Gervais, Seyssins, and Bernard Simon, Le Plessis Trevise, both of France, assignors to L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude, Paris, France

Filed Jun. 21, 1983, Ser. No. 506,444
Claims priority, application France, Jun. 29, 1982, 82 11344
Int. Cl.[4] B65D *25/02, 25/18, 90/08*
U.S. Cl. 220—465 **8 Claims**



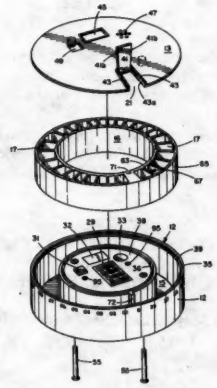
1. A container having a high degree of thermal insulation, comprising a preformed inner vessel having a frustroconical collar with an angle of convergence in the range 3° to 15°, a preformed, two-part outer vessel having a frustroconical collar with an angle of convergence in the range 3° to 15°, and a smooth-walled pre-cut neck tube connecting said inner and outer vessels together, end portions of said tube being received in said frustroconical collars of the respective vessels with an interstitial space defining a minimum radial gap up to 0.5 mm between each neck tube end portion and the respective frustroconical collar, and adhesive material received in the interstitial spaces for bonding the neck tube end portions in said frustroconical collars and defining respective bonded joints, the collars of the inner and outer vessels being frustroconical for substantially the extent of said bonded joints and the lengths of the collars, and each frustoconical collar at the beginning of its angle of convergence extending directly from a wall of the vessel to which it is associated, each wall defining a major enclosing surface of each respective vessel, said adhe-

sive material in said interstitial spaces forming a continuous bond up to 0.5 mm thickness over a significant length of the neck tube end portion, wherein the axial length of the collars measured from the minimum radial gap between the tube neck ends and their respective frustoconical collars is between 10 and 30 min.

4,572,403
TIMED DISPENSING DEVICE FOR TABLETS, CAPSULES, AND THE LIKE

Rafael Benaroya, 226 Early St., Park Forest, Ill. 60466

Filed Feb. 1, 1984, Ser. No. 575,824
Int. Cl.[4] B65D *83/04;* G06F *15/42*
U.S. Cl. 221—3 **18 Claims**



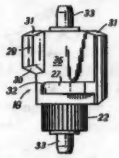
1. A dispensing system comprising a base unit having a top cover and a bottom cover, the top cover having an access opening therein, a rotatable carousel in said base unit, said carousel comprising a vertically extending, circular wall connected to an outwardly extending ring at its lower end, said circular wall having vertically extending, spaced protuberances extending inwardly from its inner surface, a tray in said carousel having a plurality of bins therein, said tray comprising a pair of circular radially spaced walls providing a circular opening proportioned to surround said circular wall on said carousel, connecting means between said carousel and said tray, a drive means connected to said carousel, a processor for actuating said drive means and including a microcomputer, switch means connected to said processor and positioned to be actuated by said protuberances and an alarm connected to said microcomputer.

4,572,404
MECHANISM FOR CUP DISPENSER

Brian Cheeseman, St. Peter, England, assignor to Roboserve Limited, Perivale, England

Continuation-in-part of Ser. No. 291,465, Aug. 10, 1981, abandoned. This application Feb. 9, 1984, Ser. No. 578,627
Int. Cl.[4] B65H *3/28*
U.S. Cl. 221—223 **10 Claims**

1. A dispenser for dispensing cups one by one from a stack comprising a plurality of cams spaced about a first axis, coaxial with the axis of the stack of cups when present, drive means for rotating the cams together, each about an associated axis parallel with the first axis, each of the cams having a cam face which is a helix about its axis and is arranged to engage the rim of the end cup of a stack of cups located in the dispenser so that rotation of the cams in one direction pushes the end cup away from the remainder of the stack to dispense it, the spiral angle of the helix of the cam being in the range of about 8 degrees to about 14 degrees, and in which the cam face of each cam is chamfered with respect to any diameter of the cam, with the

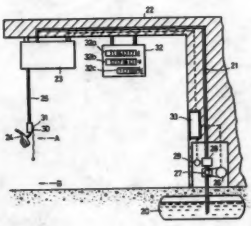


angle of chamfer of the cam face through its entire length in the range of substantially 22 degrees to substantially 28 degrees.

4,572,405
CONTROL SYSTEM FOR CONTROLLING A SUPPLY OF FLUID TO AN INTEGRAL QUANTITY

Yukio Miura, Yokohama, Japan, assignor to Tokico Ltd., Kanagawa, Japan

Filed Aug. 17, 1984, Ser. No. 641,841
Claims priority, application Japan, Aug. 19, 1983, 58-151867
Int. Cl.[4] B67D *5/30*
U.S. Cl. 222—14 **4 Claims**



1. A control system for controlling a supply of fluid to an integral quantity, said control system comprising:
- a pump for supplying a fluid;
- a motor rotated responsive to an application of a current applied thereto, for driving said pump;
- measuring means for measuring a flow quantity of the fluid which is supplied by said pump;
- setting means set during a fluid supplying operation, for stopping the supply of fluid when a quantity of supplied fluid reaches an integral quantity;
- memory means for pre-storing minimum current applying time periods in which a current is applied to said motor so as to supply predetermined minute quantities of the fluid, said minimum current applying time periods being in correspondence with each of said predetermined minute quantities; and
- control means for cutting off the current to said motor responsive to the setting of said setting means, said control means setting as a target integral value an integral value which is closest to and is greater than or equal to a flow quantity measured by said measuring means after said pump is stopped, checking to confirm that said pump is stopped and calculating a difference between said target integral value and the flow quantity measured by said measuring means, selectively setting a current applying time period with respect to said motor so as to reduce said difference based on the minimum current applying time periods pre-stored in said memory means, applying the current to said motor so as to drive said pump for said current applying time period, and repeating the sequence of operations until said difference between said target

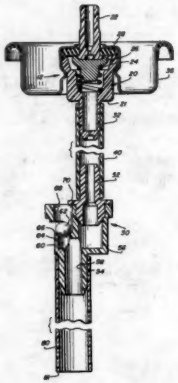
integral value and the flow quantity measured by said measuring means becomes substantially equal to zero.

4,572,406

AEROSOL CONTAINER AND VALVE ASSEMBLY FOR AUTOMATICALLY SIGNALLING DEPLETION OF A PREDETERMINED AMOUNT OF THE CONTAINER CONTENTS WHEN IN AN INVERTED POSITION

David C. Pratt, Kirkwood, and James J. Albanese, Jr., Eureka, both of Mo., assignors to Seachem, a division of Pittway Corp., Cary, Ill.

Filed Mar. 7, 1983, Ser. No. 472,478
Int. Cl.[4] B67D *5/32*; B65D *83/06*
U.S. Cl. 222—39 **6 Claims**



1. An aerosol container and aerosol valve assembly for automatically signalling, when used in an inverted position, that a predetermined amount of the contents of said aerosol container has been discharged, said valve assembly comprising

a valve body defining a hollow interior and a base,

a hollow diptube operatively connected to said valve body interior and reaching at its lower end to the bottom of said aerosol container,

a moveable valve stem for placing said interior in communication with the exterior of said aerosol container, and

liquid level spray control means defining a control opening positioned between said valve body base and said diptube lower end, said opening being positioned no closer to said valve body base than in the mid-region of the distance between said base and said lower end and no farther from said base than 80% of the distance between said base and said lower end, said control opening being in open flow communication with said valve body interior when said aerosol container and valve assembly is in the inverted position.

4,572,407

PACKAGING SAFETY MEANS FOR SYPHON TYPE POWDER DISPENSERS

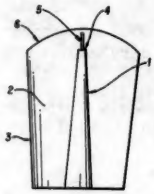
Jean-Jacques Saquet, 15, rue Pasteur, F-34500 Beziers, France

PCT No. PCT/FR83/00093, § 371 Date Jan. 25, 1984, § 102(e) Date Jan. 25, 1984, PCT Pub. No. WO83/04169, PCT Pub. Date Dec. 8, 1983
PCT Filed May 16, 1983, Ser. No. 579,909
Claims priority, application France, May 25, 1982, 82 09001
Int. Cl.[4] B67B *7/24*
U.S. Cl. 222—83 **5 Claims**

1. A container for distributing powder contents, comprising:

a frusto-conical body portion having a base, an annular side wall and a flexible domed upper section, said base having a central opening therein;

an elongated axial flow pipe attached to said base and having a first opening adjacent said flexible domed upper section and a second opening adjacent said base;



means including an integral thin plug for temporarily sealing one of said openings in said flow pipe in an air-tight manner so as to protect the contents of the container against deterioration; and

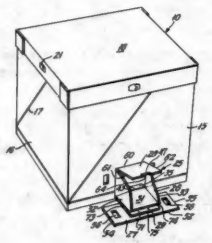
means for breaking said sealing means so that the contents can be expelled through said flow pipe under the action of external pressure applied to said container.

4,572,408

POUR SPOUT CONSTRUCTION FOR COLLAPSIBLE CONTAINERS

Julius B. Kupersmit, 145-80 228th St., Springfield Gardens, N.Y. 11413

Filed May 2, 1983, Ser. No. 490,884
Int. Cl.[4] B65D *25/46*
U.S. Cl. 222—153 **2 Claims**



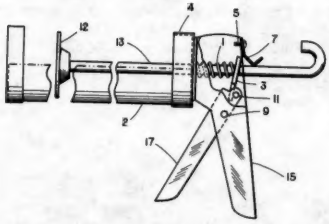
1. An improved pour spout for use with a container having a side wall and an opening in said side wall, said pour spout having a generally rectangular bottom wall, and a pair of foldably interconnected side walls, each of said side walls having at least one medially disposed fold line therein delineating a plurality of pie-shaped mutually foldable segments; whereby when said pour spout is mounted within said opening in said side wall of said container, said pour spout may be moved to closed condition to lie substantially in coplanar relation with said last mentioned wall, said bottom wall of said pour spout overlying said foldable segments; means, free of said bottom wall, selectively interconnectable with said side wall of said container, adjacent said opening, for maintaining said pour spout in closed condition, said last-mentioned means comprising a planar cover overlying said pour spout and extending laterally therefrom, and defining a pair of outwardly disposed openings in the plane thereof, said wall of said container having corresponding openings selectively underlying said first mentioned openings, and an expandable fastener means engaging the edges of said first mentioned and last mentioned openings to maintain said cover member in condition overlying said pour spout.

4,572,409

DRIP FREE CAULKING GUN

Gary Finnegan, 351 10th St., #1, Santa Rosa, Calif. 95401

Filed May 2, 1983, Ser. No. 490,886
Int. Cl.[4] B67D *5/42*
U.S. Cl. 222—391 4 Claims



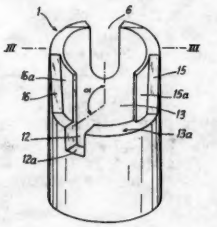
1. A drip free caulking gun having a barrel for receiving a caulking cartridge, said gun consisting of: a handle mounted on the barrel, a rod extending along the barrel and movable coaxially with the barrel, a trigger mounted on said handle, a single dog on the rod, said dog being activated by said trigger for moving said rod forwardly to exert pressure against a caulking cartridge in the barrel, said dog and rod being movable rearwardly upon release of said trigger through built up pressure in a caulking cartridge in the barrel, and a spring having one end attached to the handle and an opposite end of said spring directly contacting and exerting pressure on said rod to regulate the rearward motion of said rod, such that when the trigger is released said dog and rod are movable rearwardly and the flow of caulking compound is stopped.

4,572,410

SAFETY ACTUATOR FOR AN AEROSOL VALVE

Michel Brunet, Ste Colombe la Commanderie, France, assignor to Etablissements Valois, Le Neubourg, France

Filed Feb. 21, 1984, Ser. No. 581,622
Claims priority, application France, Feb. 25, 1983, 8303077
Int. Cl.[4] B65D *83/06*
U.S. Cl. 222—402.11 5 Claims



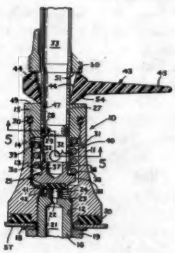
1. An aerosol dispenser, comprising:
(a) a cylindrical container (**26**) for holding a fluid to be dispensed under pressure,
(b) a centrally apertured metal dish (**22**) having an outer peripheral portion (**22***b*) sealingly crimped to an edge (**26***a*) of the container defining an opening at an upper end thereof,
(c) a valve body (**25**) disposed in the dish aperture with an inner peripheral portion (**22***a*) of the dish being sealingly crimped to the valve body to define therewith an upstanding turret (**21**) having a polygonal cross-section,
(d) a cylindrical safety sleeve (**1**) having an internal collar (**3**) defining a polygonal central aperture (**3***a*) configured to closely mate with the turret cross-section, said collar aperture being snap fitted over the turret to mount the sleeve on the container in a non-rotatable manner, and
(e) a cylindrical push button (**2**) rotatably and slidably mounted within the non-rotatable sleeve, said push button fitting over a hollow actuating rod (**28**) upstanding from the valve body and having a jet discharge orifice (**4**) communicating with an upper end of the rod.

4,572,411

VALVE ASSEMBLY FOR A DISPENSING HEAD

Richard C. Dreibelbis, Fairlawn, N.J., assignor to Emerson Electric Co. (H&H Precision Products Div.), Cedar Grove, N.J.

Filed Mar. 8, 1984, Ser. No. 587,710
Int. Cl.[4] A47G *19/14*
U.S. Cl. 222—469 4 Claims



1. In a fluid dispensing head,
a. valve body means including, a main section having, fluid passage means forming an inlet port at one end, connecting means for bringing said fluid passage means into communication with a source of fluid when said valve body means is in an operating position, and valve chamber means in communication and in alignment with said inlet port,
b. said valve body means having, a bore disposed in alignment with the said inlet port and the centerline of said valve chamber means,
c. a hollow dispensing tube slidably mounted in fluid tight relationship within said bore,
d. said dispensing tube having an inlet end, means at the inlet end normally maintaining said inlet port closed, and outlet means for dispensing fluid, and
e. means for actuating the dispensing tube to move the valve head means to an open position including, a stop member connected on said dispensing tube, fulcrum means having a collar section pivotally disposed between the valve body means and the stop member, and an operating lever connected to said collar section for controlling pivotal movement of said collar section so that the latter engages and moves the stop member and dispensing tube whereby to control the flow of fluid from said dispensing tube, said collar section having a lower face which engages and pivots on said valve body means, a first outwardly diverging beveled section extending from said lower face, an upper face which engages and pivots on said stop member, a second outwardly diverging beveled section extending from said upper face, and a tapered bore surrounding said hollow dispensing tube and diverging from said lower face toward said upper face.

4,572,412
CONTAINER MADE OF PLASTIC WHICH CAN BE ELASTICALLY DEFORMED

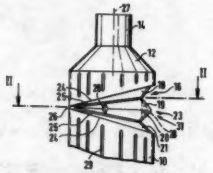
Ulrich Brach, Zell, Fed. Rep. of Germany, and Wilhelm Wiesinger, Zurich, Switzerland, assignors to Zeller Plastik Koehn, Graebner & Co., Zell, Fed. Rep. of Germany

Filed Aug. 8, 1984, Ser. No. 638,727

Claims priority, application Fed. Rep. of Germany, Aug. 9, 1983, 3328630; Dec. 1, 1983, 3343460

Int. Cl.[4] B65D *5/72*

U.S. Cl. 222—527 **12 Claims**



1. Container, in particular a bottle, made of a plastic which can be elastically deformed, with a filler and emptying pipe, characterized in that at least one part, which can be folded in, of the container wall has predetermined or nominal bending lines in the form of line-like or strip-like weakened areas, at which the container wall can be bent or folded in such a way that the pipe can be tilted relative to a portion of the container from a stable normal position into a stable inclined position and vice versa, and

(a) the part which can be folded in is bounded by nominal bending lines, which when viewed in the direction of the folding axis, diverge from one side of the container toward the other; and

(b) between the nominal bending lines is located at least one wall surface inclined to the axis of the container, this wall surface widening from one side of the container toward the other.

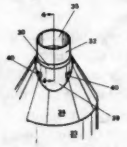
4,572,413
RESEALABLE CLOSURE ASSEMBLY FOR A CONTAINER

Kuno J. Vogt, 4250 1/2 Fairmount Ave., San Diego, Calif. 92105

Filed Sep. 30, 1982, Ser. No. 429,102

Int. Cl.[4] B05B *11/04*

U.S. Cl. 222—528 **16 Claims**



1. A resealable closure assembly for a container comprising:

a neck portion that is wider at its bottom than at its top;

a tubular extension extends upwardly from the top of said neck portion and it has a fold line where the two meet;

said neck portion having a bulge that protrudes outwardly from said neck portion when said tubular extension extends upwardly in its unfolded state, said bulge having an upright portion and a top wall portion, said bulge being deformable inwardly to seal off the top of said neck which allows said tubular member to be folded downwardly about said fold line; and

means integrally formed on said neck portion for detachably securing said tubular extension against the area of said neck portion located below said fold line, when said tubular extension is secured against said inwardly deformed bulge, substantially the entire longitudinal length of said tubular extension is sealed together in a concave cross-sectional configuration.

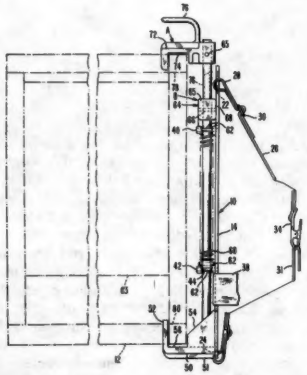
4,572,414
SMOKE EJECTOR CARRIER

Howell L. Blatt, Richboro, Pa., assignor to Ziamatic Corporation, Yardley, Pa.

Filed Jan. 7, 1985, Ser. No. 689,416

Int. Cl.[4] A45F *3/08*

U.S. Cl. 224—212 **12 Claims**



1. A carrier of the back pack type intended especially for use by a firefighter for transporting a smoke ejector having a frame that includes upper and lower cross members, comprising:

(a) a back plate;

(b) quickly connectable strap means on the back plate for attaching the same to the body of a wearer in a position in which it will be supported against the wearer's back; and

(c) means on the back plate spaced transversely thereof and releasably engageable with the upper and lower cross members of the smoke ejector, and supporting the smoke ejector upon the back plate in a position in which the ejector is substantially fixedly secured to and extends rearwardly from the back plate and said means.

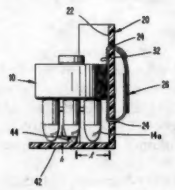
4,572,415
CARRIER FOR A REVOLVER SPEEDLOADER

Duane M. Fehr, R.D. 2, Box 2350, Stroudsburg, Pa. 18360

Filed Mar. 6, 1984, Ser. No. 586,727

Int. Cl.[4] A45F *5/00*

U.S. Cl. 224—253 **12 Claims**



1. A carrier for a revolver speedloader which has a body adapted to hold a plurality of cartriges parallel to one another in a circular pattern, said carrier comprising:

a. a back section having a pair of spaced apart slots;

b. a flexible strip passing through said slots, said strip having course and fleece thistle cloth sections to permit a closed loop to be formed by said strip, and said strip further including means, located on that portion of said strip between said slots and between said speedloader body and said back section, for holding said speedloader body against said back section; and

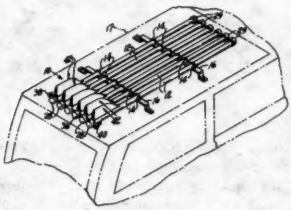
c. a base section extending outwardly from said back section, said base section having a protuberance extending upwardly a sufficient height, and located from the junction of said base and back sections a sufficient distance, to capture tips of cartridges of a loaded speedloader which is held fast against the back section by said means for holding.

4,572,416

ENCLOSING-TYPE FISHING POLE CARRIER

Niel F. Upham, 27519 W. Nine Mile Rd., Farmington Hills, Mich. 48024

Filed Oct. 25, 1984, Ser. No. 664,500
Int. Cl.[4] B60R *9/00*
U.S. Cl. 224—326 **5 Claims**



1. An enclosing-type fishing pole vehicle roof-top carrier for carrying a plurality of fishing poles, at least one of said fishing poles being provided with a fishing reel having a support post attached thereto, said carrier comprising a plurality of elongated substantially rigid tubular members, support means for holding said plurality of tubular members in an axially spaced-apart relationship and for attaching said tubular members to a vehicle rooftop, each of said tubular members having an open entry end and a closed end, a longitudinal slot having a closed end and an open end at the entry end of said tubular member for slidably receiving therein the support post of the fishing reel disposed in said tubular member and introduced into said open entry end, a removable closure cap fitted over said open entry end, means for locking said closure cap to said tubular member, and a waterproof flexible hood fastened to said tubular member over said slot for covering said fishing reel, said flexible hood having a closed end attached to said tubular member beyond the closed end of said slot and an openable end portion adapted for passage therethrough of said fishing reel mounted on said fishing pole when said fishing pole is inserted into said tubular member, wherein each of said tubular members contains a single fishing pole rigged with a fishing reel.

4,572,417

WEB TRACKING APPARATUS

Brian J. Joseph, and Stephen C. Rumsey, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

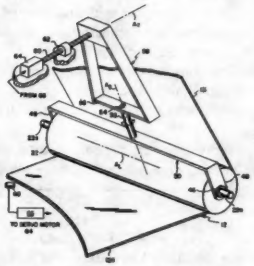
Filed Apr. 6, 1984, Ser. No. 597,800
Int. Cl.[4] B65G *39/16*; B65H *23/038, 23/26*
U.S. Cl. 226—20 **7 Claims**

1. Apparatus for controlling alignment, in a lateral direction, of a web moving along a path, said apparatus comprising:

at least one roller for supporting said web for movement along such path, said roller being a web steering roller mounted for rotation about an axis perpendicular to the plane of the span of said web approaching said steering roller;

means for sensing the lateral position of an edge of said web relative to a reference plane, as said web moves along such path, said sensing means producing a first signal proportional to the lateral position of said edge at or beyond a first predetermined location spaced from such reference plane and producing a second signal proportional to the lateral position of said edge at or beyond a second predetermined location spaced from such reference plane and from said first location; and

means for rotating said steering roller about said axis in



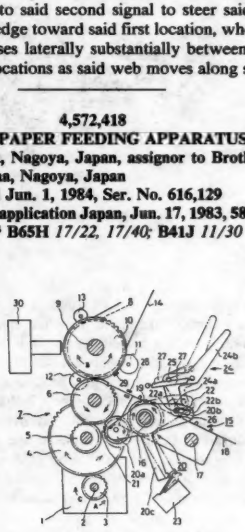
either of two opposite directions, said rotating means being responsive to said first signal to rotate said steering roller in one direction an amount proportional to said first signal to steer said web for moving said edge toward said second location, and responsive to said second signal to rotate said steering roller in the other direction an amount proportional to said second signal to steer said web for moving said edge toward said first location, whereby said edge progresses laterally substantially between said first and second locations as said web moves along such path.

4,572,418

PRINT PAPER FEEDING APPARATUS

Yoshikatsu Hirata, Nagoya, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

Filed Jun. 1, 1984, Ser. No. 616,129
Claims priority, application Japan, Jun. 17, 1983, 58-93688[U]
Int. Cl.[4] B65H *17/22, 17/40*; B41J *11/30*
U.S. Cl. 226—74 **6 Claims**



1. A print paper feeding apparatus for use in a printing machine, comprising

a paper feed motor;

a platen adapted to be loaded with a discrete print paper or a continuous print paper and rotated by said motor;

rollers held in pressure contact with said platen;

a driving gear fixedly mounted on a driving shaft;

a pin tractor having said driving shaft and adapted to be driven by said driving gear, said driving gear being rotated by said motor;

said platen and said rollers acting cooperatively to feed said

discrete paper onto said platen, and said platen and said pin tractor acting cooperatively to feed said continuous paper onto said platen;

a gear transmitting mechanism comprising a plurality of gears disposed between said motor and said platen;

an idle gear;

an actuating lever pivotally supporting said idle gear at an end thereof engaged with said driving gear, said actuating lever being movable supported on said driving shaft between an engaged position wherein said idle gear engages a gear of said gear transmitting mechanism and a disengaged position wherein said engaging of said idle gear and said gear of said gear transmitting mechanism is released;

a switching lever having one end connected to another end of said actuating lever and supported switchably between said engaged and disengaged positions, said switching lever having an operating position formed at another end thereof; and

a biasing member for urging and holding said actuating lever to and in said engaged and disengaged positions.

4,572,419

STAPLING TOOL

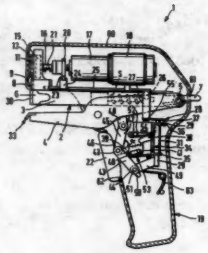
Artur F. Klaus, Frankfurt am Main, and Gottfried Piecha, Neu-Anspach, both of Fed. Rep. of Germany, assignors to Signode Corporation, Glenview, Ill.

Filed Oct. 14, 1983, Ser. No. 542,160

Claims priority, application Fed. Rep. of Germany, Oct. 23, 1982, 3239256

Int. Cl.[4] B25C *1/06*; B27F *7/11*

U.S. Cl. 227—8 **13 Claims**



1. A fastener driving tool comprising a housing assembly including a support means, a fastener magazine assembly mounted in said housing assembly, an anvil assembly pivotally mounted relative to said housing assembly adjacent to said magazine assembly, a reciprocably mounted driver blade disposed in guide means defined by said housing assembly for engaging a fastener in said magazine and driving the fastener to connect a plurality of materials disposed between the anvil and said magazine, means for positioning said anvil assembly to retain a plurality of materials disposed between the magazine and said anvil assembly, motor means including a shaft connected to said driver blade for driving said driver blade and trigger responsive means for locking said anvil in its material retaining position and for actuating said motor means and thereafter releasing said anvil to permit removal of the secured plurality of materials located between said anvil and said magazine, said means for positioning said anvil assembly including a linkage assembly containing at least one pair of links interconnected by pin means with the opposite end of one of said links connected to said anvil and the end of the other link movably connected to the support member, and the trigger responsive means includes a trigger secured to said pin means, whereby actuation of said trigger will retain materials to be joined between the anvil and magazine.

4,572,420

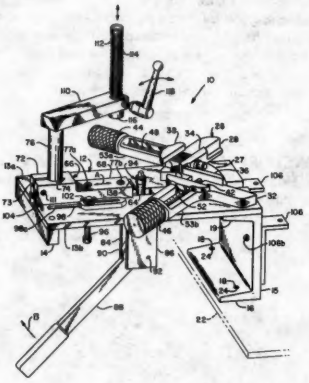
HAND LEVER OPERATED VEE NAIL FRAME ASSEMBLY MACHINE

Albert Pistorius, 22 Ingold Dr., Dix Hills, N.Y. 11746

Filed Dec. 20, 1984, Ser. No. 684,071

Int. Cl.[4] B25C *5/02, 7/00*

U.S. Cl. 227—110 **12 Claims**



1. Apparatus for joining together the mitered ends of a pair of frame members comprising:

a. means for supporting said frame members in planar relationship with their adjacent mitered ends abutting each other;

b. platform means to carry said supporting means;

c. assembly means movable between first and second positions comprising post means extending up through said platform means terminating beneath said frame members when said assembly means is in its first position, said post means comprising a post and actuating means extending below said platform means for actuating said post upwardly, said post having means to support magnetically a vee nail of magnetizable material, said post when said assembly is in its second position being accessible for mounting thereon a vee nail;

d. said actuating means including a lever operated handle means which upon rotation drives said post upwardly, and further including means in response to said post coming into contact with said frame members for driving said vee nail into said frame members thereby joining the latter together; and

e. said assembly means further comprising means for selectively clamping down on said frame members while said nail is driven into said frame members.

4,572,421

APPARATUS FOR FEEDING WIRE TO A WIRE BONDING MECHANISM

Paul Hug; William Umeda; Paul Chapdelaine, and Raymond E. Paul, all of Santa Clara County, Calif., assignors to Storage Technology Partners, Louisville, Colo.

Filed Sep. 19, 1983, Ser. No. 533,681

Int. Cl.[4] H01L *21/92*

U.S. Cl. 228—103 **14 Claims**

1. Apparatus for feeding precise lengths of wire to a bonding mechanism used to bond respective ends of said wire to pads of a workpiece, said wire feeding apparatus comprising:

feeding means for feeding said wire from a supply stool into a storage means;

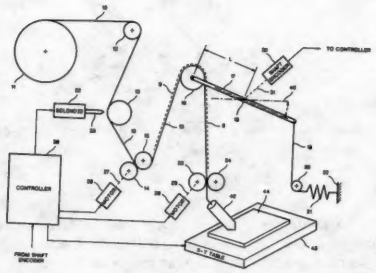
removing means for taking said wire from said storage means and supplying it to said bonding mechanism;

storage means for storing said wire fed from said supply spool comprising:

a rotating arm having first and second ends, said arm being adapted to rotate a partial revolution about a pivot point located intermediate said first and second end,

a roller attached to said first end about which said stored wire is looped from fixed points of said feeding means and removing means, and

spring bias means attached to the second end of said arm for biasing said second end, and thereby rotating said arm towards a first position,



whereby the rotation of said arm raises and lowers the first end thereof, thereby increasing and decreasing the wire loop size as measured from said fixed points, which wire loop size, held taut by said spring bias means, determines the amount of wire stored in said storage means;

measuring means for measuring the amount of said wire being fed into, removed from, or stored in said storage means; and

controlling means for controlling the operation of said feeding, removing, and measuring means.

4,572,422

CONTAINER WITH INNER POUCH AND RECLOSABLE SPOUT

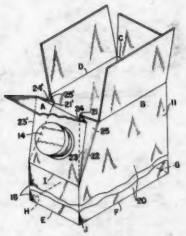
Erich Heuberger, Trugenhofen; Wolf-Dieter Knörrich, and Karl-Josef Ehrhart, both of Heidenheim, all of Fed. Rep. of Germany, assignors to Carl Edelmann Verpackungstechnik GmbH, Fed. Rep. of Germany

Filed Sep. 27, 1984, Ser. No. 655,104

Claims priority, application Fed. Rep. of Germany, Oct. 5, 1983, 3336269

Int. Cl.[4] B65D *1/08*

U.S. Cl. 229—7 R **7 Claims**



1. In a container, particularly for liquids such as oil, vinegar and fruit juices, or bulk goods and the like including

a liquid-tight inner pouch (12),

a spout (15) connected with the inner pouch (12), and

an outer shell (11) which accommodates the inner pouch (12) and through which the spout (15) extends,

the outer shell (11) having

a plurality of side walls including a first side wall (17, 18) and two adjacent side walls (20, 20') connected with said first side wall (17,18) at each lateral side of the latter, respectively, along side folding lines (J,K),

a plurality of top flaps connected with the side walls along top folding lines (A, B, C, D) and connected with each other, so that after closing of the outer shell (11) they form a closed top, and

a plurality of bottom flaps connected with the side walls along bottom folding lines (E, F, G, H_1) and connected with each other so that after closing of the outer shell they form a closed bottom, the improvement comprising

that the first side wall (17,18) has a lower wall portion (18), and and upper wall portion (17) which has an opening (16) for extending the spout (15), and is connected with the upper wall portion (17) along a front folding line (I) which is parallel to a corresponding top and bottom folding line, so that before closing of the outer shell (11) the upper wall portion (17) and the lower wall portion (18) are located in one plane,

while after closing of the outer shell (11) the upper wall portion (17) is inclined inwardly,

that each of the adjacent side walls (20, 20') has a triangular wall portion (19, 19') with an apex lying on the front folding line (I),

that each of the triangular wall portions (19, 19') has two lateral longitudinal sides connected, respectively, with the upper wall portion (17), and with the remaining portion of the respective adjacent side wall (20, 20') along two longitudinal folding lines (23, 22; 23', 22') and that it also has a central folding line (21, 21') extending from the front folding line (I) and subdividing each triangular wall portion (19, 19') into two halves so that before closing of the outer shell (11) each triangular wall portion (19, 19') lies in one plane with the remaining wall portion of the respective adjacent side wall (20, 20'),

while after closing of the outer shell (11) each triangular wall portion (19, 19') is folded inwardly, and its central folding line (21, 21') lies inside of the outer shell (11), while its longitudinal folding lines (23, 22; 23' 22') coincide with one another, thereby reinforcing said upper wall portion (17).

4,572,423

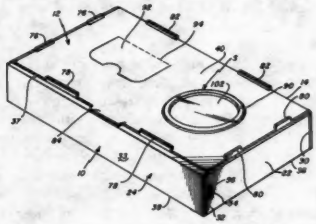
TAKE-OUT BOX WITH CUP AND LID RETAINER

Aaron Spencer, 69 Farlow Rd., Newton, Mass. 02159

Filed Aug. 8, 1984, Ser. No. 638,978

Int. Cl.[4] B65D *5/44, 5/50*

U.S. Cl. 229—28 R **6 Claims**



1. A food take-out box having provisions for holding an inner container composed of a base and lid along with other food stuffs, the lid having an upwardly-extending portion, said box comprising:

a tray having a bottom wall and peripheral walls extending upwardly from the bottom wall,

a cover integrally formed with the tray and hinged thereto through one of said peripheral walls, said cover having a top wall and peripheral flaps which fit within the peripheral walls of the tray when the cover is closed,

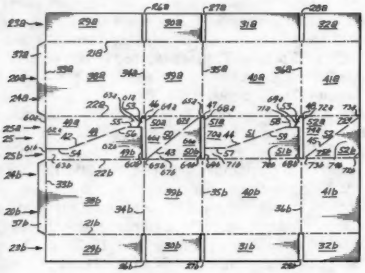
and an opening in the top wall of the cover for engaging the upwardly-extending portion of the lid and holding it firmly on the base of the container and preventing the container from sliding in the box when the cover is closed.

4,572,424

BLANK FOR A PAIR OF NESTED CONTAINERS

Herbert D. Muise, Orange, and R. Scott Hunter, San Jose, both of Calif., assignors to Weyerhaeuser Company, Tacoma, Wash.

Filed Mar. 22, 1984, Ser. No. 592,059
Int. Cl.[4] B65D 5/10
U.S. Cl. 229—39 R **15 Claims**



1. A blank for a pair of nested containers comprising

a pair of side panel sections,

each said side panel section being divided by transverse score lines into four side panels,

two of said side panels forming opposing major side panels in the erect container and

the other two of said side panels forming opposing minor side panels in the erect container, and

a glue flap attached to the outer edge of one of said outer side wall panels along a score line;

a bottom closure section extending between said side panel sections, said bottom closure section being defined by longitudinal score lines,

slots extending across said bottom closure section between said transverse score lines,

said slots dividing said bottom closure panel section into separate bottom closure panel sections,

said bottom closure panel sections associated with said major side panels being major bottom closure panel sections and said bottom closure panel sections associated with said minor side panels being minor bottom closure panel sections;

each of said major and minor bottom panel closure sections being divided by skip-cuts into major and minor bottom closure panels, said skip-cuts defining outer edges of said major and minor bottom closure panels;

each of said skip-cuts having at least a section extending obliquely across a portion of each bottom panel section, each of said oblique skip-cuts extending in the same oblique direction, and

said separate major and minor bottom closure panels of a container being interlockable in the erect container whereby each of said bottom closure panels is over one adjacent bottom closure panel and under the other adjacent bottom closure panel to lock said bottom closure panels in position in the erect container,

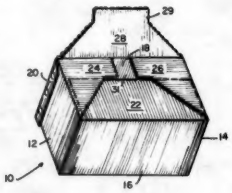
said outer edges of said bottom closure panels providing camming surfaces which allow the last placed bottom closure panel to move over one adjacent bottom closure panel and under said other adjacent bottom closure panel during inward movement of said last placed bottom closure panel in the formation of the erect container.

4,572,425

REUSABLE CONTAINER

William S. Russell, 2 Teague Dr., No. Salem, N.H. 03073

Filed Aug. 1, 1983, Ser. No. 519,325
Int. Cl.[4] B65D 5/10
U.S. Cl. 229—39 R **10 Claims**



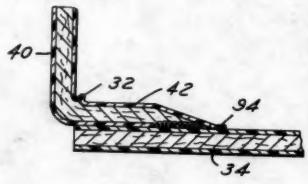
1. A container of corrugated plastic web having an opposed pair of side walls joined by a pair of end walls, the first side wall having a first side flap hingeably mounted thereto, which flap has an outside edge that is free of slots or projections for greater strength and durability so as to reduce stress concentration and damage when said flap is opened or closed, each end wall having a hingeably mounted end flap having a slant-edge terminating in an off-center blunt apex and the other side wall having a hingeably mounted second side, triangular flap terminating in a blunt substantially central apex such that said first side flap is foldable toward said container and said end flaps are foldable thereover to define a substantially central slot with said first side flap and said second side flap is foldable over said other flaps, with said central apex being insertable into said slot to interleave said other flaps in an interlocking configuration.

4,572,426

PAPERBOARD CONTAINER WITH INTERNAL RAW EDGE PROTECTION AND METHOD FOR CONSTRUCTING SAME

Robert E. Lisiecki, Orchard Lake, Mich., assignor to Ex-Cell-O Corporation, Troy, Mich.

Filed Apr. 18, 1984, Ser. No. 601,769
Int. Cl.[4] B65D 57/42
U.S. Cl. 229—48 SA **6 Claims**



4. A collapsed container formed from a one-piece thermoplastic coated paperboard blank, said container comprising:

(a) first, second, third and fourth interconnected side wall panels and a side seam flap connected to said fourth side wall panel;

(b) a plurality of top closure panels connected respectively to the upper ends of the four side wall panels and said side seam flap;

(c) a plurality of bottom closure panels connected respectively to the lower ends of the four side wall panels and said side seam flap;

(d) a skived tapered strip formed on the edge portion of said side seam flap and its associated top and bottom closure panels;

(e) a layer of sealant applied to at least one of said skived tapered strip and a strip along the length of said first side wall panel and its associated top and bottom closure panels opposite said skived tapered strip;

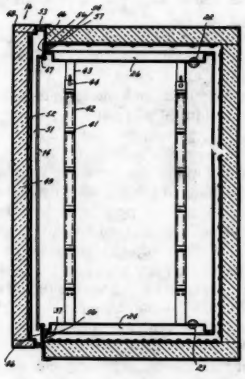
(f) two of said side wall panels being folded into overlapping relation to the remaining two side wall panels; and

(g) a bend formed at the inner edge of said skived tapered strip of said side seam flap such that the skived surface of said skived tapered strip is secured to said first side wall panel along said at least one of said sealant-covered strips to form a lap side seam.

4,572,427
CONTROLLED ATMOSPHERE ENCLOSURE

Glenn D. Selfridge, Marietta, Ohio, and Russell C. Tipton, Williamstown, W. Va., assignors to Mallinckrodt, Inc., Hazelwood, Mo.

Filed Mar. 2, 1984, Ser. No. 585,854
Int. Cl.[4] A01G *23/10*
U.S. Cl. 236—3 **4 Claims**



1. A warm air jacket controlled atmosphere incubator comprising:

a housing having (a) inner walls, each having an outer surface, defining a controlled atmosphere chamber and (b) insulated outer walls, each having an inner surface, spaced apart from the inner walls, with the outer surface of each inner wall cooperating with the inner surface of an outer wall to define an air space therebetween, all of said air spaces being interconnected;

a plurality of individual heating element arrays, a different one of said arrays being mounted adjacent the inner surface of each outer wall of the housing so that there is an individual heating element array spaced apart from the outer surface of an inner wall in each of the air spaces, the heating element arrays having greater heat densities near lower portions of the controlled atmosphere chamber than near upper portions of the controlled atmosphere chamber and the interconnected air spaces being isolated from the controlled atmosphere chamber;

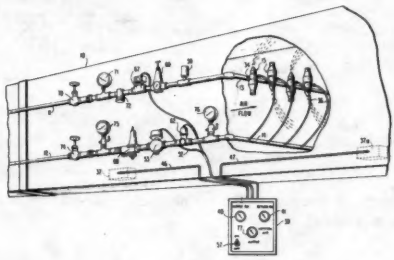
means for measuring the temperature of the chamber atmosphere; and

means, coupled to the temperature measuring means, for controlling the energization of the heating element arrays to maintain a selected temperature in the chamber, air in the air spaces moving by convection to tend to equalize the temperature in the air spaces, due in part to the heat density differences in the heating element arrays, whereby the chamber temperature is equalized.

4,572,428
IN DUCT ATOMIZING HUMIDIFICATION AND EVAPORATIVE COOLING SYSTEM

Gordon S. Groff, Lancaster, and Dean S. Herr, Willow Street, both of Pa., assignors to Herrmidifier Company, Inc., Lancaster, Pa.

Filed Jan. 8, 1985, Ser. No. 689,766
Int. Cl.[3] B01F *3/02*; F24F *3/14*
U.S. Cl. 236—44 A **12 Claims**



1. An in duct humidification and evaporative cooling system comprising in duct air and water manifold means including air/water spray heads, a first in duct relative humidity sensor/-transmitter producing a signal proportional to the relative humidity of duct return air, a second in duct relative humidity sensor/transmitter producing a signal proportional to the relative humidity of duct supply air, first and second preset external receiver-controllers receiving the two signals produced by said first and second relative humidity sensor/transmitters, an external low signal comparator-selector receiving separate output signals from the first and second preset receiver-controllers which are proportional to the amounts which the set points of the two receiver-controllers exceed the actual relative humidity levels of the duct return and supply air being sensed by the first and second in duct humidity sensor/transmitters, pressurized air and water supply lines connected with said air and water manifold means, a water modulating valve connected in said pressurized water supply line and receiving the selected low signal from said low signal comparator-selector, an on-off valve connected in each of said pressurized air and water supply lines, and means responding to the selected low signal from said low signal comparator-selector and being connected with and operable to open and close said on-off valves of the pressurized air and water supply lines.

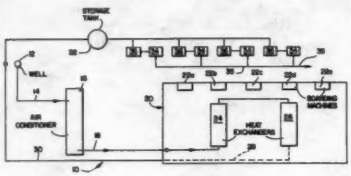
4,572,429
METHOD AND MEANS FOR CONSERVING ENERGY REQUIREMENTS AND IMPROVING WORKING CONDITIONS OF A SOCK FINISHING FACTORY

Albertus W. Huffman, Jr., Granite Falls, and Andrew Truhan, Casar, both of N.C., assignors to Albertus W. Huffman, Granite Falls, N.C.

Filed Nov. 6, 1984, Ser. No. 668,799
Int. Cl.[4] F24D *5/00*
U.S. Cl. 237—2 B **13 Claims**

1. Energy conserving system for a sock finishing factory consisting at least of a dye house, a boarding room housing a plurality of boarding machines and a warehouse comprising utilizing waste heat from the boarding machines to provide heat for the dye house water requirements and seasonal heat for the warehouse, an air conditioning system for operators of the boarding machines and means supplying some of the heat requirements for the dye house water from the air conditioning condenser system, wherein the plurality of boarding machines are mounted in a common enclosure thereby reducing radiation and convection of heat from the boarding machines to operators in the boarding room, including means for directing outside air into the boarding machine enclosure at the base

thereof and means for withdrawing heated air adjacent the top of the enclosure, and wherein the withdrawn heated air is



selectively directed to the warehouse or atmosphere depending on seasonal needs.

4,572,430

AIR CONDITIONER FOR VEHICULAR SEAT

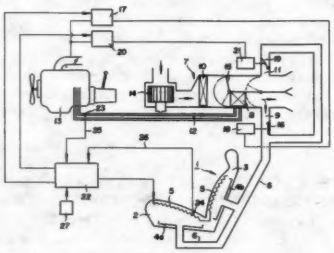
Sadaaki Takagi, Okazaki; Shigetsugu Yura, Aichi, and Masaki Fukuda, Okazaki, all of Japan, assignors to Takagi Chemicals, Inc., Okazaki, Japan

Filed Jun. 27, 1984, Ser. No. 624,971

Claims priority, application Japan, Aug. 17, 1983, 58-149107

Int. Cl.[4] G05D *23/00*

U.S. Cl. 237—2 A **8 Claims**



1. An air conditioner for a vehicular seat, comprising a seat formed of a support frame and an air-pervious cushioning member resting on said support frame and provided within said cushioning member with an electric heater and in the lower part of said cushioning member with air supply means serving to pass air to and through said air-pervious cushioning member, an air heater, an air duct interconnecting said air heater and said air supply means, means for feeding electric power to said electric heater until the temperature of said cushioning member of said seat reaches a first preset level, and valve means operative to close said air duct when the temperature of said cushioning member reaches a second preset level higher than said first preset level and to open said air duct when the temperature of said cushioning member falls below said second preset level.

4,572,431

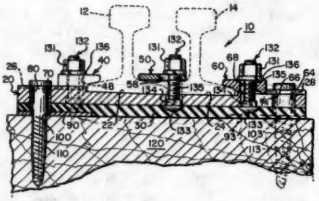
RAIL FASTENER ASSEMBLY

Michael P. Arato, Centereach, N.Y., assignor to Penta Construction Corp., East Northport, N.Y.

Filed Jun. 22, 1981, Ser. No. 275,710

Int. Cl.[4] E01B *9/62, 9/68, 5/18*

U.S. Cl. 238—283 **16 Claims**



1. Apparatus for fastening a rail to an underlying support structure comprising:

a rail plate,

a rail seat defined in an upper surface of said rail plate for supporting said rail,

at least one rail clip for engaging a flange of said rail,

means for securing said rail clip to said plate whereby said rail is held in said rail seat,

a resilient pad mounted underneath said rail seat and extending the full width of said rail plate,

means for securing said plate and pad against lateral movement with respect to said underlying support structure while permitting the plate to move vertically, said means comprising first and second holes extending through said plate and said pad on opposite sides of the rail seat, first and second hollow-centered tubes shaped to fit loosely within and directly adjacent the sides of said holes and having a length that is at least approximately the thickness of said rail plate and said pad in the region of said hole and first and second fastening elements having a shaft that fits through a hollow center of a tube and a head that bears only on an upper edge of the tube but is smaller than the holes that extends through the plate, said fastening elements securing said tubes to said underlying support structure and thereby preventing lateral movement of said rail plate and pad with respect to said support structure while the loose fit of said tubes in said holes and the size of the head of the fastening elements permit vertical movement of said rail plate with respect to said support structure.

4,572,432

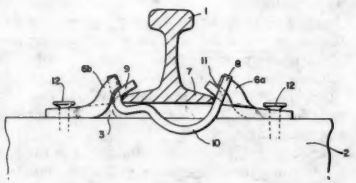
ANCHOR LOCK FASTENING ASSEMBLY

Hans-Heiner Moehren, 514 Holly Rd., Yeadon, Pa. 19050

Filed Sep. 13, 1984, Ser. No. 650,121

Int. Cl.[4] E01B *9/00, 13/02*

U.S. Cl. 238—327 R **5 Claims**



1. An anchor lock plate for converting a tie plate to an anchor lock fastening assembly which comprises

a tie plate having a rail support central channel area and

shoulder areas which extend in opposite directions from the rail support central channel area

a separate anchor lock plate fastened to at least one shoulder of said tie plate, said anchor lock plate having at least one anchor engaging portion which extends beyond the side of the tie and above the base of the rail, and at least one tie plate engaging portion which extends through the bottom of said tie plate, and a rail anchor of unitary construction containing a first portion adapted to wedge against the base of the rail and a second portion adapted to take leverage against the side of the tie, said rail anchor being overlapped by said anchor engaging portion outside the base edge of the rail with a small gap being maintained between said anchor and said anchor engaging portion.

4,572,433

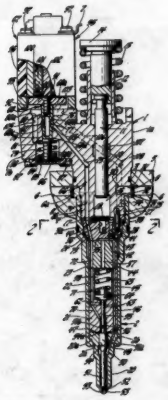
ELECTROMAGNETIC UNIT FUEL INJECTOR

John I. Deckard, Grand Rapids, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Aug. 20, 1984, Ser. No. 642,389

Int. Cl.[4] F02M *47/02, 55/00*

U.S. Cl. 239—88 **3 Claims**



2. In an electromagnetic unit fuel injector of the type including a housing means having a pump cylinder means therein; an externally actuated plunger reciprocable in said cylinder means to define therewith a pump chamber; said housing means including a valve body having a spray outlet at one end thereof for the discharge of fuel; an injection valve movable in said valve body to control flow through said spray outlet; an inlet passage means in flow communication with said pump chamber and being connectable at its other end to a source of fuel; a pressure modulated servo chamber means in said housing means, a spring means and a servo piston means operatively connected to said injection valve with said servo piston means being positioned so as to be acted on by the pressure of fuel in said servo chamber; a discharge passage means in said housing means connecting said pump chamber to said spray outlet and to said servo chamber and having a throttle orifice controlling fuel flow to said servo chamber, said housing means further including a drain passage means in flow communication at one end with said servo chamber and at its opposite end with a source of fuel at a predetermined pressure, said drain passage means including drain chamber means and a pressure equalizing chamber means in axially spaced apart relationship to each other with a guide bore extending therebetween and with a conical valve seat encircling said guide bore at the drain chamber end thereof; a pressure sensitive control valve operatively positioned in said housing means, said control valve having a stem slidably received in said guide bore and a head loosely received in said drain chamber with a valve seating surface for movement relative to said valve seat and defining therewith when unseated therefrom a drain orifice, said stem including a reduced diameter stem portion next adjacent to said valve seating surface of said head whereby to define with said guide bore an annulus chamber as part of said drain passage means; a pull type solenoid means operatively supported in said housing means, said solenoid means including an armature means operatively associated with said control valve; a valve return spring operatively associated with said control valve to normally bias said valve seating surface of said head thereof into seating engagement with said valve seat; and, a fuel passage means connectable at one end to a source of fuel at a suitable supply pressure and at its other end being in operative flow communication with said pump chamber; the improvement wherein said control valve is in the form of a poppet valve and wherein said stepped bore includes an enlarged internal diameter portion next adjacent to said valve seat whereby the pressure of fuel in said annulus cavity can act against said head in a valve opening direction and wherein the force of said valve return spring is preselected so that said control valve is also operative as a pressure relief valve.

4,572,434

FUEL INJECTION NOZZLE FOR INTERNAL COMBUSTION ENGINES

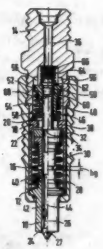
Kurt Seifert, Esslingen-Zollberg, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Dec. 9, 1983, Ser. No. 559,679

Claims priority, application Fed. Rep. of Germany, Mar. 4, 1983, 3307671

Int. Cl.[4] F02M *61/08, 61/16*

U.S. Cl. 239—453 **2 Claims**

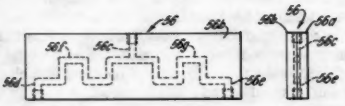


1. A fuel injection nozzle for internal combustion engines, comprising a nozzle body supported by a sleeve nut, a nozzle holder secured in said sleeve nut, a valve needle supported in said nozzle body and loaded by a closing spring that surrounds said valve needle, said valve needle opening in a flow direction of a fuel relative to a valve seat in said body, the valve needle including a piston-like extension, a bushing including a flanged rim on one end and a through bore such that said bushing surrounds said piston-like extension with a clearance that forms a throttling conduit therebetween, a shoulder formed within said nozzle holder, said bushing being supported on the shoulder of said nozzle holder via a pre-stressed support spring supported within said nozzle holder, a closing body extending into said bushing juxtaposed said piston-like extension of said valve needle, a damping chamber formed within said bushing between an end face of said piston-like extension and an end face of said closing body, said closing body including an annular collar juxtaposed said flanged rim of said bushing, a restoring spring supported on one end of said closing body, said restoring spring forcing said closing body toward said bushing and said closing body is deflectable counter to a force of the restoring spring and displaceably guided relative to said bushing.

4,572,435
FOAMABLE LIQUID DISTRIBUTING MEANS

Thomas K. Thompson, Granville, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed May 30, 1984, Ser. No. 615,404
Int. Cl.[4] B05B *1/14*
U.S. Cl. 239—553.5 6 Claims

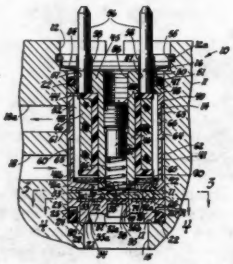


1. Foamable liquid distributing means comprising a composite block formed of two parts removably secured together and having an inlet passageway adapted to be connected to a mixing block for foamable liquid components, a plurality of spaced outlet passageways adapted to dispense foamable liquid in spaced strips onto a moving substrate material, and a plurality of connecting passageways respectively connecting said outlet passageways to said inlet passageway, each of said connecting passageways being circular in cross section and formed axially substantially half in one part of said composite block and half in the other part of said composite block and having a plurality of turbulence-producing bends therein for producing turbulence in foamable liquid flowing therethrough and thereby inhibiting build-up of foam therein, and the number of said bends being greater than would normally be required in the connection of the respective outlet passageway to the inlet passageway.

4,572,436
ELECTROMAGNETIC FUEL INJECTOR WITH TAPERED ARMATURE/VALVE

Ernest R. Stettner, Spencerport; Kenneth P. Cianfichi, Walworth, and Donald D. Stoltman, Henrietta, all of N.Y., assignors to General Motors Corporation, Detroit, Mich.

Filed Dec. 24, 1984, Ser. No. 685,742
Int. Cl.[4] B05B *1/30*; F16K *31/02*
U.S. Cl. 239—585 3 Claims

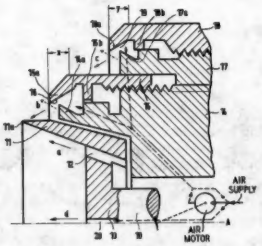


1. A fuel injector for supplying fuel to the cylinder of an internal combustion engine, said injector including a housing means having a stepped bore extending axially therethrough; an orifice valve plate fixed in said bore of said housing adjacent one end thereof to partly enclose said one end, said orifice valve plate having a valve seat surface means and an opposed outboard surface with an orifice passage means extending therethrough located concentrically with said axis; a spacer ring positioned in said housing means in abutment on one side thereof against said orifice valve plate; a solenoid means fixed in said housing means, said solenoid means including a pole piece means with a working surface means positioned at right angles to said axis and positioned in axial spaced apart opposed relationship to said valve seat surface by said spacer ring whereby to define a fuel chamber means therewith; a fuel supply means operatively associated with said housing means and said pole piece means and having one end thereof connectable to a source of fuel and having its other end in flow communication with said fuel chamber; a tapered armature valve operatively positoned in said fuel chamber asymmetrical to said axis for movement between said opposed working surface means of said pole piece means and said valve seat surface; a spring means operatively associated with said armature valve to normally bias said armature valve into seating engagement with said valve seat surface; said armature valve presenting a working surface inclined at an angle to said axis whereby the axial movement of said armature valve between said valve seat surface and said working surface means of said pole piece means is greater adjacent to said orifice passage means than at a location diametrically opposite thereof; and an armature locator operatively fixed to said tapered armature and operative within said spacer ring whereby to prevent radial and lateral motion of said armature valve within said spacer ring so as to maintain said armature valve in operative relationship to said valve seat surface.

4,572,437
ELECTROSTATIC SPRAYING APPARATUS

Willi Huber, Heerbrugg, and Markus Schmidhauser, Diepoldsau, both of Switzerland, assignors to J. Wagner AG, Switzerland

Filed Apr. 12, 1983, Ser. No. 484,281
Claims priority, application Fed. Rep. of Germany, Apr. 19, 1982, 3214314
Int. Cl.[4] B05B *5/04*
U.S. Cl. 239—703 9 Claims



1. Electrostatic spray apparatus for applying a liquid coating material to a workpiece, comprising:

a rotatable bell-like atomizer head for receiving and centrifugally atomizing liquid coating material and propelling the same as a cloud towards the workpiece;

first means defining a first annular gap coaxial about said atomizer head for connection to a compressed air supply for controlling the outer limits of the cloud; and

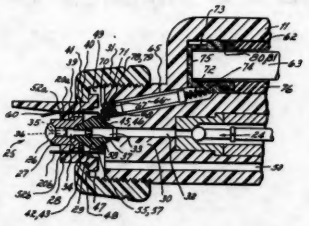
second means defining a second annular gap coaxial about said first annular gap for connection to a compressed air supply for returning to the cloud those particles of the liquid coating material which erupt out of the cloud,

each of said first and second means comprising a first element including a first section limiting the respective air gap, and a second ring element mounted on and coaxially movable with respect to said first element and including a second section limiting the respective air gap.

4,572,438
AIRLESS SPRAY GUN HAVING IMPROVED NOZZLE ASSEMBLY AND ELECTRODE CIRCUIT CONNECTIONS

John C. A. Traylor, Elyria, Ohio, assignor to Nordson Corporation, Amherst, Ohio

Filed May 14, 1984, Ser. No. 609,764
Int. Cl.[4] B05B 5/02
U.S. Cl. 239—708 19 Claims



1. An airless spray gun for electrostatically coating a substrate with an atomized liquid, comprising:

a spray gun body having a passage therethrough adapted to convey a liquid coating material which is under pressure;

a spray nozzle through which coating material can issue in an airless atomized spray;

spray nozzle mounting means for removeably mounting said spray nozzle on said spray gun body and in fluid communication with said liquid passage for flow of coating material from said liquid passage to said nozzle;

an electrode, said electrode carried by said spray nozzle mounting means and having a forward portion extending from said spray nozzle mounting means and adjacent said nozzle for generating an electrostatic field to charge the atomized coating material, and a rearward portion formed into a spiral spring;

electrical circuit means for carrying a high voltage to said electrode, said electrical circuit means including an electrode contact member engaging said spring portion of said electrode for electrical connection of said electrode to said electrical circuit means;

said spray nozzle mounting means including a nozzle mount for said nozzle having a bore through which the coating material passes to said nozzle, and sealing means for connecting said nozzle mount bore with said liquid passage, said sealing means having an axial channel for flow of coating material from said liquid passage to said nozzle mount bore, said electrode spring portion engaging said sealing means and holding said sealing means and said nozzle mount together when said spray nozzle mounting means is removed from said spray gun body.

4,572,439
ATTRITION RESISTANT PARTICLES AND PREPARATION OF SAME

Emory W. Pitzer, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Nov. 30, 1983, Ser. No. 556,676
Int. Cl.[4] B02C 19/12
U.S. Cl. 241—1 7 Claims

1. A process for separating frangible particles of a fluidizable catalyst support from attrition-resistant particles in a sample containing both attrition-resistant and frangible particles, wherein the particles have a particle size predominantly in the range of 20 to about 200 microns; said process comprising

(a) slurrying the particles of the sample in a liquid medium to form a slurry;

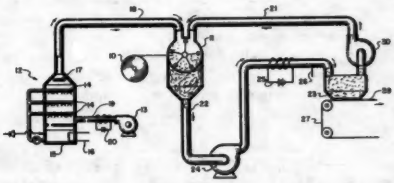
(b) directing acoustical energy into the slurry to disintegrate the frangible particles, wherein the acoustical energy expended is in the range of from about 0.5 to about 2 kilowatt-hr/kilogram of slurried particles; and

(c) recovering the attrition resistant particles of the sample from the liquid medium.

4,572,440
FIBER MOISTURE CONTROL IN THE FORMATION OF DRY-LAID WEBS

Thomas Tao, Neenah, Wis., assignor to James River-Dixie/-Northern, Inc., Conn.

Filed Jun. 18, 1981, Ser. No. 274,804
Int. Cl.[4] B02C 19/12
U.S. Cl. 241—23 19 Claims

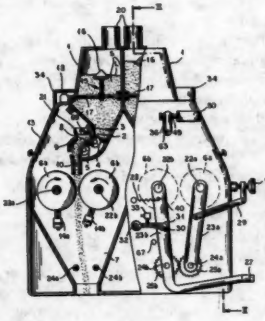


1. A method of forming an air laid fibrous web, the method comprising the steps of defiberizing a bulk source of cellulosic fiber in a defiberizer; transporting the defiberized fibers pneumatically to a forming header, the transport medium having a relative humidity as measured just upstream of the forming header, the relative humidity being below saturation but sufficiently high to preserve an average moisture content of the fibers to be laid at least above 2.5% by weight, the defiberizer having a relative humidity corresponding thereto as adjusted for differences in operating conditions, and dispensing said fibers from the forming header onto a foraminous support means, whereby the fibrous web is formed.

4,572,441
PNEUMATIC CONTROL SYSTEM FOR GRINDING MILL

Guido Sangati, Padua, Italy, assignor to Sangati S.p.A., Padua, Italy

Filed Mar. 9, 1984, Ser. No. 587,935
Claims priority, application Italy, Mar. 10, 1983, 19998 A/83
Int. Cl.[4] B02C 25/00
U.S. Cl. 241—34 7 Claims



1. In a grinding mill for converting farinaceous seeds into flour, including a hopper for receiving seeds to be ground, a pair of counterrotating cylinders for comminuting said seeds, and a transport roller for extracting the seeds from the hopper

and delivering same to said cylinders, the combination therewith of:

a movable cover plate confronting said transport roller and defining therewith a gap of variable width through which the seeds must pass on their way to said cylinders:

detector means in said hopper for determining the seed level therein; and

pneumatic means controlled by said detector means for displacing said cover plate to vary the width of said gap in a manner generally proportional to said seed level, said pneumatic means comprising:

a pilot valve responsive to said detector means,

a servomotor fluidically controlled by said pilot valve to shift said cover plate with reference to said transport roller, said servomotor being constituted on a double-acting cylinder having a piston linked at one end with said cover plate, and

an ancillary valve pneumatically settable by said pilot valve to direct high-pressure air selectively to a pair of ports at opposite ends of said cylinder.

4,572,442

BOWL-TYPE GRINDING APPARATUS

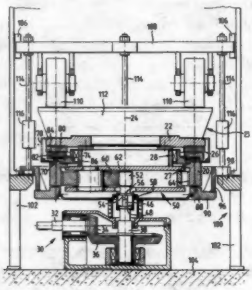
Hans Sigg, Mutschellen, Switzerland, assignor to Maag Gear-Wheel & Machine Company Limited, Zurich, Switzerland

Filed Oct. 24, 1983, Ser. No. 544,936

Claims priority, application Switzerland, Oct. 29, 1982, 6313/82

Int. Cl.⁴ B02C *15/00*

U.S. Cl. 241—117 **9 Claims**



1. A bowl-type grinding apparatus comprising:

a roll carrier;

at least two milling rolls journalled in said roll carrier;

a milling platen arranged below said roll carrier and including a grinding bowl and an axial thrust bearing defining a substantially vertical axis;

said axial thrust bearing supporting said milling platen;

drive means including speed reduction gearing;

said drive means and said speed reduction gearing thereof being conjointly mounted below said axial thrust bearing;

a flange;

a framework supporting said flange;

said milling platen bearing upon said framework through said flange;

said speed reduction gearing being arranged within said milling platen;

a housing for said speed reduction gearing;

said axial thrust bearing having a predetermined region for transmitting axial force;

said housing being arranged substantially in line with said predetermined region and connected to said flange of said milling platen such that axial forces generated by said at least two milling rolls and transmitted through said milling platen, said axial thrust bearing and said housing follow a substantially straight line;

at least two tie rods interconnecting said flange and said roll carrier for conducting said forces back to said roll carrier and ultimately said framework; and

said roll carrier being supported on said framework.

4,572,443

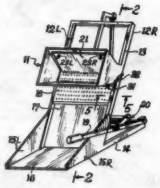
MEAT SHREDDER

Herby Coleman, Fountain of Youth, #282, Rte. 1 Box 12, Niland, Calif. 92257

Filed Feb. 14, 1985, Ser. No. 701,545

Int. Cl.⁴ B02C *43/25*

U.S. Cl. 241—166 **8 Claims**



1. An apparatus for shredding fibrous substances which comprises:

a main support frame;

parallel rails secured to said main support frame;

a comminuting surface having parallel rows of teeth and slideably mounted on said rails;

said teeth being shaped and sharpened to shred in only one direction;

a hand lever capable of vertical oscillatory movement;

means for transmitting said vertical oscillatory movement to said comminuting surface;

a hopper for holding meat to be shredded, said hopper being rigidly attached to said frame and having its inner open end facing said comminuting surface;

at least one comb-edged wiping plate pivotally and resiliently mounted on the inner open end of said hopper;

said plate being biased to clear the passage of shredded substance when said comminuting surface moves in said one direction, and to wipe pieces of substance caught between the teeth of said comminuting surface with its moves in the opposite direction.

4,572,444

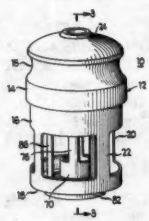
FOOD CHOPPER

Laurine R. Shadduck, 6220 Byron St., Rosemont, Ill. 60018

Filed May 3, 1984, Ser. No. 606,581

Int. Cl.⁴ A47J *43/00*; B26B *3/04*

U.S. Cl. 241—168 **7 Claims**



1. In a food chopper having a handle and a plurality of concentric cylindrical cutting blades, each of said blades including a vertical wall and a cutting edge at the bottom thereof with flowthrough openings formed in the vertical walls of said

blades with adjacent flowthrough openings being separated by relatively narrow structural struts and aggregating a substantial portion of the surface area of each of the vertical walls, the improvement comprising: a first handle member closing the top of the outermost of said blades having a plurality of flexible finger members forming a generally cylindrical area; a block member carrying at least two concentric cutting blades; a second handle member projecting from said block member adapted to snap fit into the central cylindrical area defined by said finger members; spring means mounted in said block member to urge one of said concentric cutting blades outwardly so that the cutting edge thereof is normally positioned outwardly of the cutting edge of the outermost blade; and a retainer member mounted to the top of said block member for retaining one of said concentric cutting blades within said block member and for retaining said spring means within said block, whereby said one blade automatically moves longitudinally repsonsive to each compression of the copper against a resistive surface and release thereof.

4,572,445

HOUSEHOLD APPLIANCE FOR TREATING FRUIT AND VEGETABLES

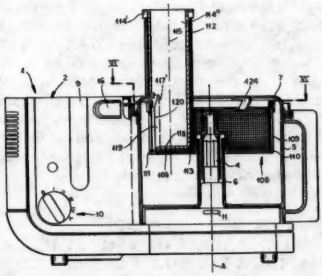
Guido Cristante, Omegna, Italy, assignor to I.P.E. Nuova Bialetti S.p.A. Industria Prodotti Elettrodomastici, Crusinallo di Omegna, Italy

Filed Feb. 6, 1984, Ser. No. 577,151

Claims priority, application Italy, Feb. 4, 1983, 20688/83[U]; Feb. 4, 1983, 20689/83[U]

Int. Cl.⁴ B02C *18/12*

U.S. Cl. 241—37.5 **11 Claims**



1. A device for the treatment of produce, comprising:

a cylindrical treatment vessel centered on a vertical axis;

a centrifugal grater in said vessel centered on said axis and rotatable thereabout, said grater having an abrasive bottom and a peripheral screen;

drive means coupled with said grater for rotating same;

a cover normally closing the top of said vessel, said cover being penetrated by a vertical guide tube offset from said axis for enabling the introduction of produce into said grater; and

a pusher receivable in said guide tube for forcing produce to be treated into contact with said abrasive bottom at a location adjacent the inner surface of said screen, said pusher having a hollow stem with a closed lower end and with a side aperture above said lower end bounded by lateral edges closely adjoining said inner surface upon introduction of said pusher into said guide tube, the lateral edge downstream in the direction of rotation of the grater scraping said inner surface to remove adhering fragments to the interior of said stem for withdrawal with said pusher.

4,572,446

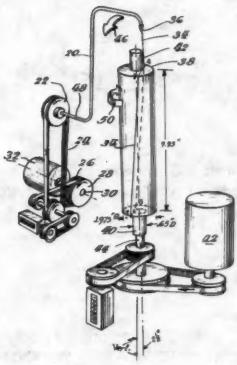
PROCESS FOR MAKING A FIBER BUNDLE

Ronald J. Leonard, Harvard, and Kenneth M. Johnson, Lindenhurst, both of Ill., assignors to Omnis Surgical Inc., Deerfield, Ill.

Filed Mar. 23, 1984, Ser. No. 592,835

Int. Cl.⁴ B65H *81/08*

U.S. Cl. 242—7.02 **8 Claims**



7. A process for making a fiber bundle, having a void fraction of radially outward annuli, comprising the steps of:

providing a core having a longitudinal axis;

winding at an angular velocity a length of the fiber around the core end over end from an arm in a plane that is at an acute angle with respect to the longitudinal axis of the core and is between opposite ends of the core;

providing relative circumferential rotation between said core and the position of the winding arm;

during winding of the fiber around the core end over end, increasing the ratio of (a) the angular velocity of the wind and (b) the relative rotational velocity between the longitudinal axis of the core and the position of the winding arm whereby the void fraction of radially-outward annuli of the wound bundle is less than the void fraction would be if the ratio remained constant.

4,572,447

DOUBLE-SIDED TEXTILE MACHINE

Hans Raasch, Monchen-Gladbach, Fed. Rep. of Germany, assignor to W. Schlafhorst & Co., Monchen-Gladbach, Fed. Rep. of Germany

Filed Sep. 10, 1984, Ser. No. 648,895

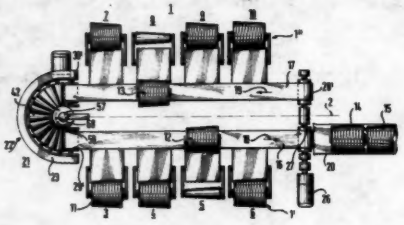
Claims priority, application Fed. Rep. of Germany, Sep. 8, 1983, 3332409

Int. Cl.⁴ B65H *54/20, 67/06*

U.S. Cl. 242—35.5 A **14 Claims**

1. Double-sided textile machine, comprising a plurality of bobbin assemblies between first and second ends of the textile machine for producing cross-wound bobbins; a device for collecting and transporting the bobbins produced in the bobbin assemblies, including a bobbin collection station in vicinity of said first end of the machine, a first bobbin transport belt for receiving bobbins axially aligned in a first transport direction from a first side of the machine and for moving the bobbins toward said collection station in said first transport direction, a second bobbin transport belt similar to said first transport belt for receiving bobbins axially aligned in a second transport direction opposite said first transport direction from a second side of the machine and for moving the bobbins away from said collection station in said second transport direction, a substantially semicircular device disposed in vicinity of said second end of the machine for sequentially removing bobbins from

said second transport belt, for turning the bobbins through substantially 180° and for transporting the bobbins onto said



first transport belt, said substantially semicircular device including a roller conveyer having tapered rollers accelerating the bobbins.

4,572,448

DRAGGING DEVICE FOR A SPINNING REEL

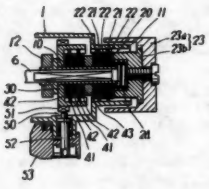
Masuo Ban, Sakai, Japan, assignor to Shimano Industrial Company Limited, Osaka, Japan

Filed Sep. 24, 1984, Ser. No. 653,837

Claims priority, application Japan, Sep. 30, 1983, 58-183922

Int. Cl.⁴ A01K *89/01, 89/02*

U.S. Cl. 242—84.5 A **8 Claims**



1. A dragging device for a spinning reel including a reel body, a spool shaft slidable longitudinally relative to the reel body and a spool mounted on the spool shaft, said dragging device applying a rotational resistance force against rotation of said spool shaft and comprising a first drag mechanism and a second drag mechanism each for applying a rotational resistance force against rotation of said spool shaft; said first drag mechanism comprising first dragging members connected to said reel body, second dragging members connected to said spool shaft, said second dragging members being rotatable together with said spool shaft, and an adjusting means for bringing said first and second dragging members in press-contact with each other to adjust an amount of said rotational resistance force applied against rotation of said spool shaft; said second drag mechanism comprising a rotary member rotatable with respect to said spool shaft, third dragging members connected to said rotary member, fourth dragging members connected to said spool shaft, said fourth drag members being rotatable with said spool shaft, and a press-contact means for bringing said third and fourth dragging members into press-contact with each other, said dragging device further comprising a locking mechanism interposed between said rotary member and said reel body to lock said rotary member to said reel body to prevent said rotary member from rotating with said spool shaft.

4,572,449

PACKAGE MOUNTING APPARATUS

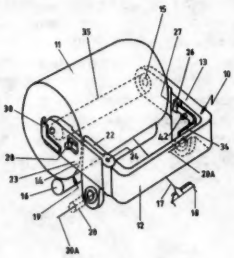
Geoffrey Naylor, Macclesfield, United Kingdom, assignor to Rieter Scragg Limited, Cheshire, United Kingdom

Filed Aug. 21, 1984, Ser. No. 642,888

Claims priority, application United Kingdom, Sep. 28, 1983, 8325995

Int. Cl.⁴ B65H *54/54*

U.S. Cl. 242—18 DD **17 Claims**



1. A package mounting apparatus for a textile machine, said package mounting apparatus comprising a cradle which, in use, is pivotally mounted in said machine, said cradle having a pair of arms adapted to receive and support a package therebetween, at least one of said arms having at least a part thereof movable towards and away from the other of said arms between a package retaining arm position and a package release arm position, wherein said cradle is pivotal through a first angular movement between a start of package build cradle position and a full package cradle position and through a second angular movement between said full package cradle position and a package release cradle position, said package mounting apparatus further comprising biasing means operable on said movable cradle arm part to bias said movable cradle arm part away from the other of said cradle arms towards said package release position and retaining means operable on said movable cradle arm part to retain said movable cradle arm part in said package retaining arm position whilst said cradle is disposed between said start of package build cradle position and said full package cradle position.

4,572,450

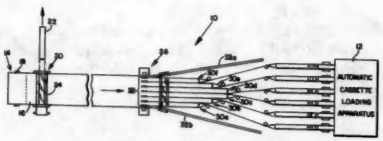
METHOD AND APPARATUS FOR SIMULTANEOUSLY LOADING A PLURALITY OF TAPE CASSETTES

Kenneth L. Lindquist, Holden, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Aug. 30, 1984, Ser. No. 645,553

Int. Cl.⁴ B65H *69/06, 19/20;* **B31F** *5/06*

U.S. Cl. 242—56 R **6 Claims**



1. In a method of attaching webs to leaders, the improvement comprising the steps of:

clamping two lengthwise spaced apart portions of said web;

severing a section intermediate said spaced apart portions of said web from said web, said section having a given length and extending fully across said web;

connecting said two spaced apart web portions to one another with an adhesive tape extending across the space provided by said severed web section; and

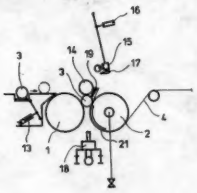
severing said adhesive tape intermediate said two spaced apart web portions to provide a pair of adhesive lips extending beyond the ends of respective said spaced apart web portions, said adhesive lips thus being available to be adhered to ends of leaders.

4,572,451

METHOD AND DEVICE FOR WINDING PAPER

Noriaki Ikeda, Tokyo; Mutsunori Kai, Noda, and Hiraki Asai, Tokyo, all of Japan, assignors to Ishikawajima-Harima Jukogyo Kabushiki Kaisha, Japan

Filed Oct. 23, 1984, Ser. No. 664,013
Claims priority, application Japan, Dec. 27, 1982, 57-234801
Int. Cl.[4] B65H *19/20, 19/08*
U.S. Cl. 242—56 R **2 Claims**



1. In a method for winding a sheet of paper in which a core is supplied between a pair of horizontally disposed rollers and is pressed against said pair of rollers by a rider roller and the sheet of paper is wrapped around one of said pair of rollers so as to wind said sheet of paper around said core, the improvement comprising sucking and holding a leading edge portion of said sheet of paper by said one roller when the winding operaton is started, shortening the extended leading edge portion of said sheet of paper by reverse rotation of said one roller, spraying an adhesive with a suitable viscosity against said core from a position below said core, rotating said core and said pair of rollers so that said leading edge portion of said sheet of paper is clamped between a portion of said core which is applied with said adhesive and said one roller and is bonded to said core, rotating said pair of rollers at a low speed so that any slack of said sheet of paper whose leading edge portion is bonded to said core is eliminated, thereafter rotating said pair of rollers at a high speed to wind said sheet of paper around said core, and after completion of the winding of said sheet of paper into a roll of paper, spraying an adhesive with a suitable viscosity against the roll of paper from below so that said sheet of paper is bonded by a weight of the roll of paper itself, thereafter cutting off said sheet of paper and pushing out said roll of wound paper.

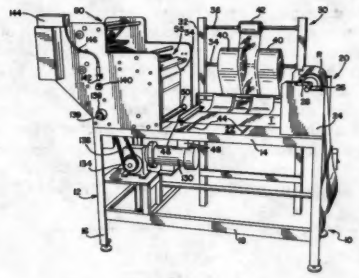
4,572,452

APPARATUS FOR SLITTING AND WINDING TAPE

John S. Driscoll, Huntley, and Robert E. Palka, Morton Grove, both of Ill., assignors to Illinois Carbon Products, Algonquin, Ill.

Filed Nov. 21, 1984, Ser. No. 674,231
Int. Cl.[4] B65H *35/02, 19/04;* **B32B** *3/04*
U.S. Cl. 242—56.2 **6 Claims**

1. Apparatus for packaging lift-off tapes having leader segments into rolls on cores from an endless supply of tape, comprising a base having a rotatable supply shaft for supporting said endless supply of tape, said base having a working surface aligned with said supply shaft, at least first and second spaced mandrels rotatably supported on an opposite end of said base and aligned with said working surface and said supply shaft, guide means between said working surface and said mandrels for guiding said supply of tape along a predetermined path, cutter means associated with said guide means for cutting said supply of tape longitudinally across its width into a plurality of narrow strips with said strips being separated into alternating groups respectively directed toward said first and second spaced mandrels, said guide means including first and second guide rollers respectively located in the path of movement of said first and second groups, each of said guide rollers including a one-piece unit rotatably supported at opposite ends and having alternating reduced circular segments with adjacent surfaces of respective enlarged circular segments having a spacing substantially equal to the width of a narrow strip to maintain accurate alignment for opposite edges of each narrow strip with respect to the cores on said mandrels, and leader supply means including an upstanding support having first and second vertically-spaced shafts extending generally parallel to said path with first and second rolls of leader material axially spaced on said first shaft and a roll of connecting material on said second shaft positioned between said first and second rolls of leader material and having overlapping edges therewith so that a portion of supply of tape can be severed on said working surface and replaced with spaced segments of leader material interconnected by connecting material.

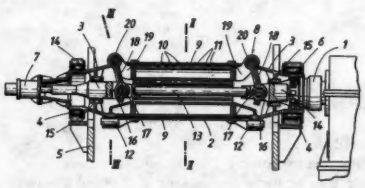


4,572,453

COILER FOR STRIP METAL

Franz Hirschmanner, Leoding, Austria, assignor to Voest-Alpine Aktiengesellschaft, Linz, Austria

Filed Sep. 5, 1984, Ser. No. 647,671
Claims priority, application Austria, Oct. 21, 1983, 3741/83
Int. Cl.[4] B65H *17/02*
U.S. Cl. 242—72 R **11 Claims**



1. A coiler for forming a coil of strip metal, comprising
(a) a rotatably mounted coiler shaft adapted to be driven about an axis;
(b) a coaxial hollow reel having a periphery for supporting the coil and non-rotatably connected to the coiler shaft,
(1) the hollow reel defining a plurality of apertures in the periphery thereof;
(c) a plurality of members associated with respective ones of the apertures and radially movable between a first position wherein the members are retracted from the apertures and a second position wherein the members protrude from the apertures to apply pressure to the coil supported on the periphery of the hollow reel;
(d) an expanding mechanism extending through the reel for moving the pressure-applying members into the second position;

(e) an actuating mechanism operatively connected to the expanding mechanism and operable to move the pressure-applying members into the second position; and the improvement of

(f) said apertures and said pressure-applying members being axially spaced apart along said reel;

(g) said expanding mechanism comprising two expanding members disposed diametrically opposite each other with respect to the axis and carrying said pressure-applying members,

(1) the expanding members being pivotally movable relative to the hollow reel about diametrically opposite pivotal axes which extend parallel to the axis and

(2) the actuating mechanism being operable to impart equal and opposite movements to the expanding members about the pivotal axes, and

(h) mounting means non-rotatably connected to the reel and extending axially outside thereof, said expanding members being pivoted to the mounting means on the pivotal axes at a point disposed outside and axially spaced from the reel.

4,572,454

FISHING REEL

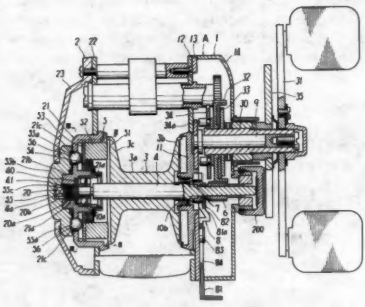
Yoshiyuki Furomoto, Sakai, Japan, assignor to Shimano Industrial Company Limited, Osaka, Japan

Filed Mar. 26, 1984, Ser. No. 593,521

Claims priority, application Japan, Mar. 30, 1983, 58-47184

Int. Cl.⁴ A01K *89/02*

U.S. Cl. 242—84.52 B **5 Claims**



1. A fishing reel comprising:

a reel body,

a spool supported rotatably to said reel body and having a spool shaft,

a drive mechanism for driving said spool,

a clutch mechanism for making said spool freely rotatable with respect to said drive mechanism,

a magnet brake comprising an electric conductor and magnets for applying a rotation resistance to said spool upon free rotation of said spool, said magnet brake being provided with an adjusting member for adjusting a rotation resistance imparted to the free rotation of said spool, said adjusting member being disposed at an axial one end side of said spool shaft in said reel body,

a cast-control member adapted to contact with an end free of said spool shaft at said axial one end side thereof so as to apply a rotation resistance to said spool shaft, said cast-control member being provided at the same side of said reel body as said one side where said adjusting member is disposed, and an association means provided between said adjusting member and said cast-control member for producing an operation of said cost-control member upon operation of said adjusting member.

4,572,455

FISHING REEL WITH REVERSIBLE CRANK

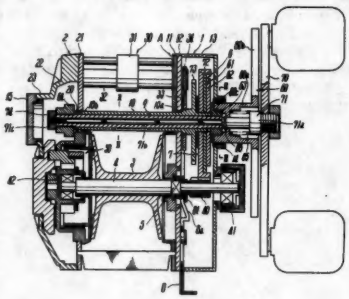
Hideo Noda, Sakai, Japan, assignor to Shimano Industrial Company Limited, Osaka, Japan

Filed Jul. 2, 1984, Ser. No. 626,977

Claims priority, application Japan, Jun. 30, 1983, 58-119880

Int. Cl.⁴ A01K *89/02*

U.S. Cl. 242—84.1 R **6 Claims**



1. A fishing reel comprising:

a pair of side frames having side plates opposite to each other at a regular interval,

a spool shaft rotatably supported between said side frames and having a spool arranged in said interval between said side plates,

a drive mechanism for driving said spool shaft, said drive mechanism comprising a handle shaft having a handle, a drag mechanism for applying a rotational resistance against rotation of said spool, and a master gear for receiving a drive force of said handle shaft through said drive mechanism and transmitting the drive force to said spool shaft,

said drive mechanism including a tubular shaft which has an axis substantially parallel to an axis of said spool shaft and extending through said side plates at said side frames to be rotatably supported between said side frames, said tubular shaft supporting at one axial end said drag mechanism and said master gear, said tubular shaft having a central portion with an inner cavity for receiving said handle shaft, said inner cavity opening outwardly of each of said side plates, said handle shaft being selectively insertable into either axial end of said tubular shaft, said driving mechanism further comprising fixing means for detachably fixing said handle shaft after said handle shaft has been inserted into said tubular shaft with respect to said tubular shaft, and

a drag operating member rotatably supported on said handle shaft at a side thereof at which said handle is mounted, said drag operating member comprising means for adjusting said rotational resistance applied by said drag mechanism responsive to rotation of said drag operating member relative to said handle shaft.

4,572,456

AUTOMATIC LOCKING TYPE TAKE-UP APPARATUS

Yoshihiro Makishima, Yokohama, Japan, assignor to NSK-Warner K.K., Tokyo, Japan

Filed Oct. 3, 1984, Ser. No. 657,483

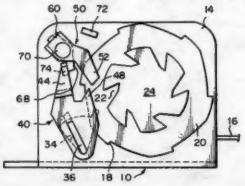
Claims priority, application Japan, Oct. 6, 1983, 58-154334[U]

Int. Cl.⁴ A62B *35/00*; B65H *75/48*

U.S. Cl. 242—107.4 D **3 Claims**

1. An automatic locking type take-up apparatus including a base, take-up means rotatably supported by said base and biased in a webbing take-up direction, a latch plate rotatable with

said take-up means, lock means capable of assuming a locking position in which it is engaged with the latch portion of said latch late to block draw-out of webbing and a non-locking position in which it is out of engagement with said latch portion to permit draw-out of the webbing and biased toward said locking position, and control means mounted radially outwardly of the latch plate on said base and resiliently contacting



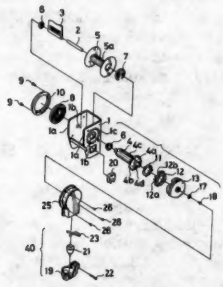
said latch plate and interlocking therewith and engageable with said lock means, said control means keeping said lock means in said non-locking position when it assumes a first position during the draw-out of the webbing and permitting the movement of said lock means to said locking position when it assumes a second position when some rewinding of the webbing after the draw-out thereof has been sensed.

4,572,457

EMERGENCY LOCK RETRACTOR

Kazumi Hirata, Fujisawa, Japan, assignor to NSK-Warner K.K., Japan

Filed Jan. 8, 1985, Ser. No. 689,771
Claims priority, application Japan, Jan. 19, 1984, 59-4612[U]
Int. Cl.[4] A62B *35/02*; B65H *75/48*
U.S. Cl. 242—107.4 A **4 Claims**



1. In an emergency lock retractor equipped with a base, a take-up spindle supported rotatably on the base and holding a take-up reel, on which a webbing is wound, fit fixedly thereon, means for biasing the take-up spindle in the webbing winding direction, and locking means actuated in the event of emergency to prevent the take-up spindle from rotating in the webbing releasing direction, the improvement wherein the locking means comprises:

(a) locking teeth arranged on the base of the retractor;

(b) an interlocking member provided between the take-up spindle and the locking teeth and displaceable between a first position where the interlocking member is out of engagement with the locking teeth and a second position where the interlocking member is brought into engagement with the locking teeth and take-up spindle so as to restrain any further rotation of the take-up spindle;

(c) a spring member engageable at one portion thereof with the take-up spindle and at another portion thereof with the interlocking member, thereby normally causing the interlocking member to rotate together with the take-up spindle and biasing the interlocking member toward the first position while holding the interlocking member out of engagement with the take-up spindle;

(d) a locking member loose-fit on the take-up spindle and rotable together with the take-up spindle and adapted to cause the interlocking member to shift from the first position to the second position, said locking member defining teeth in the circumference thereof, the teeth of said locking member being chamfered at root portions thereof; and

(e) inertia sensing means adapted to be brought into engagement with the locking member in the event of emergency so that the locking member is restrained from any further rotation and the take-up spindle is caused to rotate relative to the locking member, said inertia sensing means including a weight capable of sensing a speed change of a vehicle beyond a predetermined level and a ratchet lever adapted to transmit each motion of the weight to the locking member,

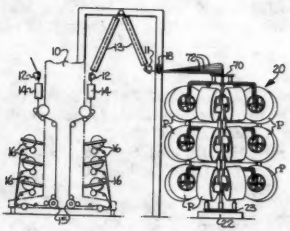
thereby causing the tip of one of the teeth of the locking member to extend over the contacting surface of the ratchet lever and the tip of the ratchet lever to be received in the chamfered portion of the associated tooth when the ratchet lever is brought into contact with the tooth.

4,572,458

COMPACT CREEL FOR LARGE DIAMETER YARN SUPPLY PACKAGES

Dieter H. Bluhm, and Volker Drumm, both of Charlotte, N.C., assignors to American Barmag Corporation, Charlotte, N.C.

Filed Nov. 14, 1984, Ser. No. 671,450
Int. Cl.[4] B65H *49/02*; D02H *1/00*; D03J *5/08*
U.S. Cl. 242—131 **21 Claims**



1. A compact creel for providing a continuous supply of feeder yarns to a textile yarn processing machine from unusually large diameter feeder yarn supply packages from which the yarn is adapted to be withdrawn over one end thereof, said creel comprising a frame, a plurality of yarn package support means carried by said frame in spaced-apart positions for supporting paired large diameter feeder yarn supply packages in spaced-apart positions with their corresponding yarn withdrawal ends in substantially facing relationship to each other with the angle between the longitudinal axes thereof being greater than 90 degrees, one of each of said pairs of large diameter feeder yarn supply packages being adapted to act as a yarn feeding supply package while the other paired yarn supply package acts as a reserve yarn supply package, and yarn guide means positioned at the apex of the angle formed by the longitudinal axes of the paired yarn supply packages for guiding the yarn as it is withdrawn from the paired yarn supply packages and for directing the yarn to the textile yarn processing machine.

4,572,459
CONTROLLABLE AND ADJUSTABLE YARN TENSIONER

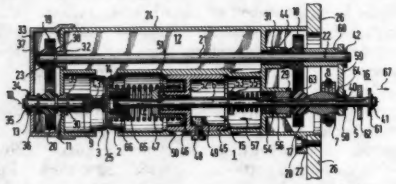
Heinz Kamp, Wegberg, and Wilhelm Zitzen, Mönchengladbach, both of Fed. Rep. of Germany, assignors to W. Schlafhorst & Co., Monchen-Gladbach, Fed. Rep. of Germany

Filed Mar. 5, 1984, Ser. No. 585,971

Claims priority, application Fed. Rep. of Germany, Mar. 3, 1983, 3307491

Int. Cl.⁴ B65H *59/22*

U.S. Cl. 242—150 R **12 Claims**



1. Controllable and adjustable yarn tensioner having two rotationally driven brake plates, between which yarn to be placed in tension is guided, comprising first and second rotationally supported shafts, one of the brake plates being disposed at one end of and in operative engagement with said first shaft, the other end of said first shaft having an operative connection with a driving device; the other of the brake plates being disposed at one end of and in operative engagement with said second shaft; both said first and said second shafts being in mutual alignment along a common rotary axis, said other end of said first shaft being also connected, via a transmission system disposed outside of said brake plates, to the other end of said second shaft; one of said two brake plates having a compression spring contributorily determining the braking force at which the brake plates are applied, whereby the braking force is adjustable by adjusting the length of the spring; said first shaft being axially slideable; and a brake plate-disengagement device connected to said first shaft for sliding said first shaft axially in a direction away from the other brake plate.

4,572,460
MEANS FOR PULLING TAPE FROM A REEL

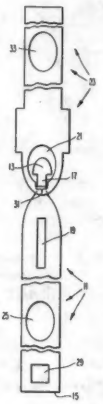
Friedrich R. Hertrich, Boulder, Colo., assignor to Digital Equipment Corporation, Maynard, Mass.

Filed Feb. 13, 1984, Ser. No. 579,776

Int. Cl.⁴ G03B *1/04*; G11B *15/32*

U.S. Cl. 242—195 **1 Claim**

1. Means for enabling a take up reel to pull tape from a supply tape reel comprising in combination: take up leader means to be coupled to said take up reel, said take up leader means having first and second ends and formed to have an enlarged section supported by a relatively narrow stem section at said first end, said take up leader means further formed to have a first smoothing aperture therein which first smoothing aperture lies between said first end and said second end such that when said take up leader means is wrapped around said take up reel said stem section lies substantially in said first smoothing aperture and said take up leader further formed to have a locating aperture disposed in close proximity to said first end whereby in response to a tool being inserted in said locating aperture said enlarged section can be held in position to be passed through a locking aperture and said take up leader further formed to have a securing aperture located in close proximity to said second end whereby said take up leader can be readily secured to said take up reel; supply tape leader means to be connected to tape on said supply tape reel, said supply tape leader means having first and second end and formed to have a locking aperture at said first end, said supply tape leader means further formed to have securing means at said second end to be secured to said tape on said supply tape reel, said locking aperture formed to have a first section which is wide enough to pass over said enlarged section while being further formed to have a narrow section which can accept said stem section while blocking passage of said enlarged section therethrough whereby in response to passing said enlarged section through said first section of said locking aperture and moving said enlarged section toward said narrow section, said stem section and said enlarged section become locked with said narrow section, said supply tape leader means further formed



to have a second smoothing aperture therein disposed between said locking aperture and said second end of said supply tape leader means whereby when said supply tape leader means is wrapped on said take up reel around said take up leader means said enlarged section lies substantially in said second smoothing aperture to effect a smooth wrapping of said supply tape leader means and said take up leader means when tape is pulled from said supply tape reel onto said take up reel.

4,572,461
MAGNETIC TAPE CASSETTE

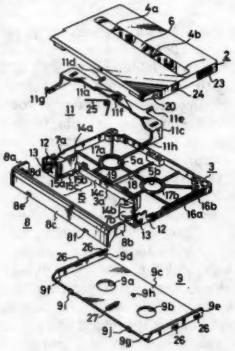
Kenichi Horikawa, Tokyo; Yoshinori Yamamoto, and Kenji Kawakami, both of Kanagawa, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Dec. 6, 1984, Ser. No. 678,813

Claims priority, application Japan, Dec. 22, 1983, 58-242542

Int. Cl.⁴ G03B *1/04*; G11B *15/32, 23/04*

U.S. Cl. 242—198 **3 Claims**



1. A magnetic tape cassette comprising:

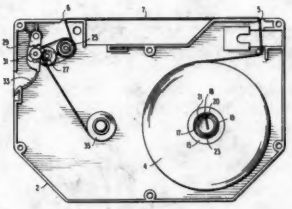
(a) a cassette casing having incorporated therein a pair of reel hubs around which a magnetic tape is wound;
(b) a rotatable front lid provided at a front portion of said cassette casing and covering an opening formed through said front portion of said cassette casing; and
(c) a sliding plate provided at one surface of said cassette casing so as to be freely slidable in the front and rear direction, wherein
when said sliding plate is slidably moved to a first sliding position, a pair of reel shaft insertion apertures into which said pair of reel hubs are rotatably inserted and a cut-out portion for drawing out said magnetic tape are exposed, while when said sliding plate is slidably moved to a second sliding position, said reel shaft insertion apertures and said cut-out portion are closed by said sliding plate, said front lid having at its both side end portions arm portions having rotary shafts, in which when said sliding plate is slid to said second sliding position, a closed state of said front openable and closable lid is restricted by the cooperation of a front end portion of said sliding plate with said arm portions;
(d) an elastic engaging portion extended to a front portion of said cut-out portion of said cassette casing and having an elastic protruding piece member at its tip end, and;
(e) an engaging aperture formed through said sliding plate with which said protruding engaging piece member is engaged under the state that said cut-out portion is closed by said sliding plate, whereby to restrict the sliding movement of said sliding plate.

4,572,462

APPARATUS FOR TRANSFERRING MATERIAL FROM A FEED SPOOL TO A TAKE-UP SPOOL

Marcel Inkel, Colchester, Conn., assignor to Placo Molders Inc., Bloomfield, Conn.

Filed Oct. 18, 1983, Ser. No. 543,042
Int. Cl.[4] B41J *35/28;* G03B *1/04*
U.S. Cl. 242—199 **10 Claims**



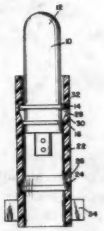
1. An apparatus for transferring material from a feed spool to a take-up spool that is rotated by a machine with which the material is used, said apparatus comprising:
a base;
a centerpost connected to said base;
a feed spool having an annular core mounted rotatably about said centerpost, and having an outer surface of said core operable to receive material wound in a first direction, and being further operable to transfer the material from said core upon rotation of said feed spool in a second direction opposite to the direction in which the material is wound upon said core;
a take-up spool connected to said base and being operable to receive the material transferred from said feed spool by winding the material about said take-up spool; and
a generally circular coil spring interposed between said centerpost and said core having at least one portion but at most only two portions of its surface in continuous immediately adjacent abutment with a corresponding portion of an inner surface of said annular core;
said inner surface of said annular core being smooth, unobstructed, and concentrically circular with respect to said core, such that it has only a single circular surface;
said at least one but at most only two portions of said outer surface being in direct frictional engagement with said corresponding immediately abutted portion or portions of said smooth inner surface of said core; whereby the rate of rotation of the spool in the direction of transfer will be dampened by frictional interaction between said coil spring and the inner surface of said core and said coil spring will deform during material transfer such that upon termination of material transfer a degree of reverse rotation in the direction in which the material is wound upon said core will be imparted to said core.

4,572,463

TELESCOPIC PROJECTILE AND APPARATUS FOR FIRING SAME

Aryeh Ashkenazi, Rehov Yerushalayim 38, Bat Yam, Israel

Filed Sep. 7, 1982, Ser. No. 415,696
Claims priority, application Israel, Sep. 20, 1981, 63885
Int. Cl.[4] F42B *13/32*
U.S. Cl. 244—3.3 **5 Claims**



1. A telescoping projectile comprising:
a forward inner portion containing an explosive charge;
a rearward outer portion;
said forward inner portion being disposed within said rearward outer portion prior to firing of said projectile and being operative to move forward relative to said rearward outer portion upon firing of said projectile; said rearward outer portion being formed with an inner surface defining a stop configuration; and said forward inner portion defining at the rearward portion thereof forward and rearward circumferential sealing rings, said forward circumferential sealing ring being arranged to engage said stop configuration at the maximum forward position of said forward inner portion relative to said rearward outer portion; said rearward circumferential sealing ring being operative to provide a pressure seal between said forward inner portion and said rearward outer portion when said forward circumferential sealing ring is disposed adjacent said stop configuration, whereby at least one of said forward and rear sealing rings provides a pressure seal between said forward inner portion and said rearward outer portion at all relative positions thereof.

4,572,464

CHANGE-CONFIGURATION CLIMBING CHOCK

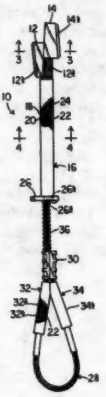
Douglas D. Phillips, Star Rte. 2193, Camp Sherman, Oreg. 97730

Filed Oct. 17, 1983, Ser. No. 542,687
Int. Cl.[4] A63B *29/02*
U.S. Cl. 248—1 **5 Claims**

1. A change-configuration climbing chock for providing a protection point for a rock climber comprising
an elongate, flexible tubular body with plural hollow chambers, and with a flange at one end,
a first flexible cable with one end formed in a reverse bend

loop and fastened with a collar, with a free end extending interiorly through one of said body's hollow chambers, and exposed at said body's other end,

a second flexible cable fixedly attached adjacent said flange and extending interiorly through another of said body's hollow chambers,



first and second wedge elements rectilinearly engaged, slidable between a large lateral dimension and a small lateral dimension, each secured to one of said cables,

means for preventing non-linear displacement of said wedge elements, and

yieldable biasing means acting between said collar and said flange, tending to urge the wedges to their large lateral dimension.

4,572,465

DEVICE FOR INSTALLING AUTOMOBILE RADIOS ON AUTOMOBILE DASH PANELS BY FRONTAL APPLICATION AND WITHOUT THE USE OF SCREWS

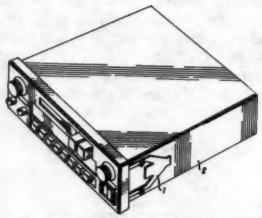
Luigi Rasca, Trezzano sul Naviglio, Italy, assignor to Silem s.r.l., Milan, Italy

Filed May 3, 1984, Ser. No. 606,524

Claims priority, application Italy, Nov. 18, 1983, 23782 A/83

Int. Cl.⁴ G12B *9/00*

U.S. Cl. 248—27.1 **9 Claims**



1. A device for installing automobile radios, comprising a fixed support box fixed to an automobile front panel by means of four round dogs disposed in apertures in said box, said apertures having toothed edges, and rack means for moving said dogs by rotation along said toothed edges of said apertures until said dogs come into contact with the automobile front panel and exert pressure thereon, said dogs being operated by means of a hexagonal key inserted into a bore in a center of each said dog, said dogs also comprising facets on their outer edge.

4,572,466

HARNESS CLIP

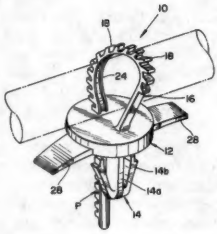
Noboru Yamaguchi, Zama, and Kiichiro Ito, Chigasaki, both of Japan, assignors to Nissan Motor Co., Ltd. and Kato Hatsujo Kaisha Limited, both of, Japan

Filed Apr. 25, 1984, Ser. No. 603,750

Claims priority, application Japan, May 27, 1983, 58-93441

Int. Cl.⁴ F16L *3/12*

U.S. Cl. 248—73 **10 Claims**



1. A one-piece plastic harness clip comprising:

a plate-like base having an aperture passing therethrough;

an anchor leg projecting from one side of said base;

a resilient strap projecting from the other side of said base and having a series of teeth for engagement with said base when inserted at its free end portion into said aperture;

an elongated projection formed on and extending longitudinally of said anchor leg; and

an elongated groove extending longitudinally of said strap and interengageable with said projection to hold said free end portion of said strap in contact with said anchor leg.

4,572,467

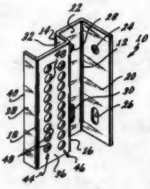
ROLLER SHADE MOUNTING BRACKET

Regis Farrell, 7634-1 Los Verdes Dr., Rancho Palos Verdes, Calif. 90274

Filed Mar. 27, 1984, Ser. No. 593,851

Int. Cl.⁴ A47H *1/14*

U.S. Cl. 248—257 **5 Claims**



1. A mounting bracket for a window shade roller comprising a single sheet of material bent along parallel bend lines into a plurality of planar portions, including at least first, second and third planar portions, said first portion being joined at a right angle to said second portion along a first bend line,

a connecting portion joined to said second portion along a second bend line and extending from said second portion in the same direction as said first portion,

said third portion being parallel to said second portion and joined to said connecting portion along a third bend line, and

a flange joined to said third portion along a fourth bend line, said flange terminating substantially at the plane of said second portion,

said first and second portions being apertured for receiving fasteners for affixing the bracket to a mounting surface,

said third portion having formed therein a plurality of roller-pin receiving apertures.

4,572,468

SEATS

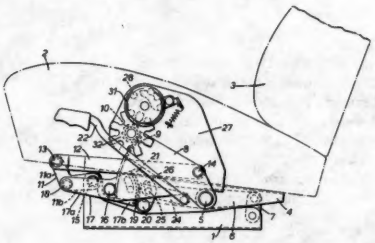
Dieter Lange, Petershagen, and Bernd Deptolla, Niederwöhren, both of Fed. Rep. of Germany, assignors to P. A. Rentrop Hubbert & Wagner Fahrzeugausstattungen GmbH & Co. KG, Stadthagen, Fed. Rep. of Germany

Filed Jun. 22, 1983, Ser. No. 506,825

Claims priority, application Fed. Rep. of Germany, Jun. 23, 1982, 3223380

Int. Cl.[4] A45D *19/04*

U.S. Cl. 248—394 **7 Claims**



1. A seat including

a seat or back rest support,

a seat or back rest part,

a bottom frame connected to said part, and

a device for adjusting the position of said part relative to said support in a stepwise manner, said device including

a rotary knob,

a disc carrying a plurality of transversely extending pins and coupled to said knob for rotation therewith about an axis,

a gear wheel having teeth defined by flanks, which teeth are co-operable with said pins and are defined within an outer peripheral envelope, said flanks of the teeth which adjoin said outer envelope being constructed such that reaction forces due to contact between said flanks and said pins are directed so as to pass through said disc axis,

a pinion connected to said gear wheel,

a toothed segment in engagement with said pinion,

a rear transverse shaft rotatably mounted in said bottom frame and connected to said toothed segment,

an angled two-arm lever,

a longitudinal rod having two ends, one end of which is articulated on said toothed segment while the other end is articulated on one arm of said angled lever,

a front transverse shaft rotatably mounted in said suport and connected to the other arm of said angled lever, and

respective link connected to said rear transverse shaft, each of which is articulated on said support.

4,572,469

LATCHING ARRANGEMENT FOR SEAT SLIDE STRUCTURES

Richard W. A. Rees, West Bloomfield, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Mar. 11, 1985, Ser. No. 710,288

Int. Cl.[4] F16M *13/00*

U.S. Cl. 248—430 **1 Claim**

1. A seat slide comprising, in combination, a pair of generally U-shaped internested track members, each track member including a base wall, side walls extending therefrom and terminal flanges, with the base wall, side walls and terminal flanges of the track members being located in respective opposed spaced relationship to each other, bearing means movably supporting one track member on the other track member for movement relative thereto, the base wall of the one track member including an opening therethrough, one side wall of the other track member including a series of openings therein, at least one of which is alignable with at least one opening in one of the terminal flanges of the one track member, a latch member having its inner side overlying the outer side of the base wall of the one track member and including fulcrum portions fulcruming the latch member on such base wall to one side of the opening in such base wall, the latch member including a latch portion extending inwardly of the base wall of the one track member through the opening therein and terminating in at least one laterally extending latch tooth engageable with one of the openings in the side wall of the other track member

and the one opening in the flange of the one track member to latch the track members to each other, a torsion type spring member including first and second portions biased toward each other, the first portion of the spring member engaging the inner side of the base wall of the one track member and the second portion of the spring member engaging the outer side of the latch member to engage the inner side of the latch member with the outer side of the base wall of the one track member and maintain the latch tooth within the openings in the side wall of the other track member and terminal flange of the one track member, and means secured to the latch member to rotate the latch member about the fulcrum portions thereof and move the latch tooth out of the opening in the side wall of the other track member to permit movement of the one track member relative to the other track member.

4,572,470

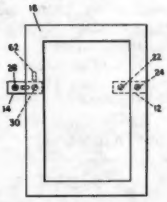
NON-REMOVABLE PICTURE FRAME HANGER AND HANGING METHOD

David W. Siffert, 420 S. Union, Traverse City, Mich. 49684, assignor to David E. Siffert, Williamsburg, Mich.

Filed Sep. 25, 1981, Ser. No. 305,487

Int. Cl.[4] A47F *7/14*

U.S. Cl. 248—551 **13 Claims**



1. A non-removable hanger for mounting a picture frame on a wall comprising;

a pair of elongated hanger members that fit behind the vertical sides of the picture frame, the hanger members being formed such that lower portions thereof are pivotably attachable to the back of the picture frame and upper portions of the hanger members are pivotable outwardly to an accessible position on the outer side of the picture frame, the accessible upper portions being pivotably attachable to the wall;

fastener means for pivotably attaching the lower portions of the hanger members to the back of opposite vertical sides of the picture frame for pivotal movement in the plane of the back of the picture frame;

fastener means for alternately pivotably attaching the outwardly extending upper portions of the hanger members to

the wall for pivotal movement in the plane of the wall, the fastener means being attachable in positions such that after the hanger members are both attached to the wall and the picture frame is suspended by the hanger members, the fastener means attaching the upper portions of the hanger members to the wall are positioned behind the picture frame; and

locking means for locking at least one of the hanger members in position after it has been attached to both the picture frame and the wall and moved to its position to support the picture frame.

4,572,471

SPRING-EQUIPPED MECHANICAL VIBRATION DAMPER

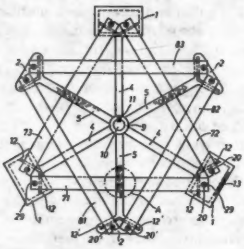
Rudolf Schrepfer, Küsnacht, Switzerland, assignor to Rudolph Schrepfer AG, Kusnacht-ZH, Switzerland

Filed Mar. 23, 1984, Ser. No. 592,516

Claims priority, application Switzerland, Aug. 31, 1983, 4784/83

Int. Cl.⁴ F16F *7/00*

U.S. Cl. 248—560 **9 Claims**



1. A spring-equipped mechanical vibration damper comprising stacked, alternately-disposed, rigid spiders and leaf spring sets, each spider containing a central hub defining a central opening, a rod disposed in said openings supporting the spiders stacked in concentric relation to each other, said rod securing the spiders from rotation relative to each other, each spider comprising radially-disposed arms fixed at their proximal ends to the hub, mounting plates fixed to the distal ends of the arms, supports and connectors on the mounting plates, each leaf spring set comprising flat leaf spring sections disposed with their opposite ends resting on the supports at the ends of the arms and connected to said connectors thereon, said arms of the spiders having line contact with the subjacent leaf spring sections midway between the ends of the leaf spring sections and wherein the mounting plates of the lowermost spider are structured to rest upon a foundation.

4,572,472

ELECTRIC MOTOR FLEXIBLE MOUNTING SYSTEM AND METHOD OF ASSEMBLY

Jeffrey S. Eder, Somerville, Mass., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jun. 2, 1982, Ser. No. 384,351

Int. Cl.⁴ F16F *15/04*

U.S. Cl. 248—605 **7 Claims**

1. An electric motor mounting system comprising, in combination:

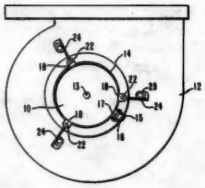
a motor having a generally cylindrical exterior and a longitudinal shaft;

a band encircling said motor exterior;

said band comprising a unitary sheet metal element having a major portion lying against said motor exterior and, at each of a plurality of spaced locations, a pair of axially spaced projections outwardly extending from said major portion with apertures therein aligned parallel with the shaft axis;

a hinge pin extending through said apertures of said pair of projections at each of said locations;

a mounting arm, for said hinge pin at each of said locations, having a torsionally flexible characteristic and substantial rigidity both longitudinally and radially in relation to said shaft when said mounting arm is attached for operation of



said motor, said mounting arm comprising a unitary sheet metal element located with flat surfaces in a longitudinal direction parallel with the shaft axis;

said mounting arm having a first extremity comprising a substantially cylindrical element through which said hinge pin extends;

said mounting arm having a second extremity comprising means for attaching said arm to a housing in which said motor is to be mounted.

4,572,473

DEFLECTABLE SIGN AND STAND

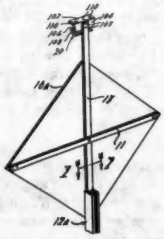
James R. Seely, Rochester, Mich., assignor to Marketing Displays, Inc., Farmington Hills, Mich.

Continuation-in-part of Ser. No. 442,378, Nov. 17, 1982, abandoned, and a continuation-in-part of Ser. No. 442,418, Nov. 17, 1982, and Ser. No. 442,419, Nov. 17, 1982. This application May 25, 1983, Ser. No. 497,815

The portion of the term of this patent subsequent to Oct. 22, 2002, has been disclaimed.

Int. Cl.⁴ F16M *13/00*

U.S. Cl. 248—624 **13 Claims**



1. In a sign and sign stand assembly, said sign having at least one mounting means thereon, said sign stand including a frame member, frame deflection means for resiliently deflecting said frame member downwardly generally along a predetermined plane in response to first wind forces exerted generally transverse to the plane of said sign, and attachment means for attaching said mounting means to said frame member, the improvement comprising sign pivot means for permitting said sign to pivotally swing about a generally vertical axis in response to second wind forces exerted generally parallel to the plane of said sign, said pivoted sign being oriented generally transverse to said second wind forces in order to allow said frame member to deflect generally along said predetermined plane, said attachment means including means for retaining said mounting means on said frame member during said pivot-

ing of said sign and said deflection of said frame member, said mounting means including a generally vertical cross-brace on said sign, said attachment means including at least a pair of channels on said frame member, said channels adapted to receive a portion of said vertical cross-brace therebetween in a frictional engagement therewith in order to secure said portion to said frame, said vertical cross-brace being sufficiently flexible to allow the unsecured portion of said vertical cross-brace to torsionally twist in order to permit said sign to pivotally swing in response to said second wind forces, said assembly further including warning device supporting means on said vertical cross-brace for attaching a warning flag or the like thereto, said vertical cross-brace being sufficiently rigid to support said warning devices supporting means and said warning flag but sufficiently flexible to allow said torsional twisting.

4,572,474

MOUNTING ASSEMBLY FOR MACHINES

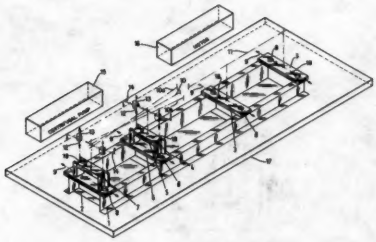
Hans-Joachim Derlich, Hessheim, Fed. Rep. of Germany, assignor to Klein, Schanzlin & Becker Aktiengesellschaft, Frankenthal(Pfalz), Fed. Rep. of Germany

Filed Mar. 5, 1984, Ser. No. 585,973

Claims priority, application Fed. Rep. of Germany, Mar. 5, 1983, 3307923

Int. Cl.[4] F16M *1/00*

U.S. Cl. 248—639 **23 Claims**



1. A mounting assembly for machines, particularly for mounting a centrifugal pump-drive motor unit, said assembly comprising:

(a) support means; and

(b) mounting means for mounting at least one machine on said support means, said mounting means including at least one mounting unit having a mounting element which is connectible with the machine, and said mounting unit further having a carrier for said mounting element disposed on said support means, said carrier and said mounting element being provided with cooperating guide means for permitting rotation of said mounting element relative to said support means.

4,572,475

FORM FOR POURING OF CONCRETE OR THE LIKE

Josef Maier, Schwimmbadstrasse 3. D-7611 Steinach, Fed. Rep. of Germany

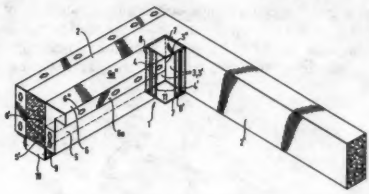
Filed Jan. 16, 1985, Ser. No. 691,903

Claims priority, application Fed. Rep. of Germany, Jan. 31, 1984, 3403148

Int. Cl.[4] E04G *11/00*; B28B *7/30*

U.S. Cl. 249—194 **18 Claims**

1. A form section for insertion into the space between three mutually inclined walls, particularly between two girders which define an upright corner and a ceiling overlying the corner, comprising first and second panels defining an elongated corner with a first end a second end; and a third panel overlying one end of the corner between the first and second panels and defining a chamber with said first and second panels; and coupling means for facilitating connection of said first and second panels to additional panels, said coupling means including first and second substantially plate-like coupling members extending along said first and second panels and to



said third panel and defining an inlet which afford access to said chamber.

4,572,476

METHOD FOR DETECTING A FOCUS CONDITION OF AN IMAGING OPTICAL SYSTEM EMPLOYING INTERPOLATED SIGNAL VALUES

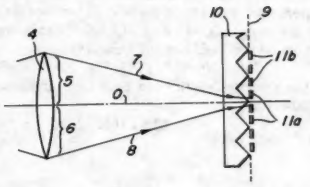
Kenichi Oinoue, Tokyo, Japan, assignor to Olympus Optical Company Limited, Tokyo, Japan

Filed May 20, 1983, Ser. No. 496,404

Claims priority, application Japan, May 25, 1982, 57-88335

Int. Cl.[4] G01J *1/20*

U.S. Cl. 250—201 **9 Claims**



1. In a method for detecting a focus condition of an imaging optical system comprising dividing a light flux emanating from the imaging optical system into a first light flux which is transmitted through a first region of the imaging optical system and a second light flux which is transmitted through a second region of the imaging optical system, said second region including a portion different from the first region, projecting separately the first and second light fluxes onto first and second light receiving element arrays to produce first and second sets of photoelectrically converted output signals, and deriving a correlation between the first and second sets of output signals to detect a focus condition of the imaging optical system due to a lateral shift of first and second images formed on said first and second light receiving element arrays by said first and second light fluxes, the improvement comprising

modifying at least one of said first and second sets of output signals by deriving therefrom interpolated values which approximate output signals at intermediate positions between successive light receiving elements of at least one of the first and second light receiving element arrays.

4,572,477

REGULATED GAS FLOW CONTROL VALVE

James R. Phlipot; Steve R. Pinkston, and Leland L. Seghetti, all of St. Louis, Mo., assignors to Essex Industries, Inc., St. Louis, Mo.

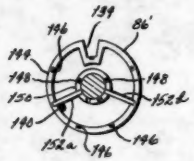
Filed Sep. 30, 1983, Ser. No. 537,653

Int. Cl.[4] F16K *51/00*

U.S. Cl. 251—285 **3 Claims**

1. For use with a gas flow control valve including a valve

body and a control knob rotatable with respect to the control body for controllably varying the rate of gas flow through said valve, apparatus for limiting rotation of said knob between preselected arcuate limits, comprising a plurality of slots carried by said knob on the under side of said slots being defined by annular sets of radial inner and outer notches in concentric relationship with there being an annular space between said



sets of notches and at least one removable bar for selective placement in such slots for defining preselected limits of rotation of said knob, said bar being configured for bridging said annular space, a stop fixed relative to said valve body for interengagement with said bar for preventing rotation of said knob past the preselected limits, said stop engaging said bar within said annular space.

4,572,478

THROTTLE-VALVE CONNECTION PIECE

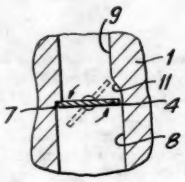
Hans-Ulrich Vogler, Frankfurt am Main; Gerhard Ruschek, Hattersheim, and Horst Schlick, Schwalbach, all of Fed. Rep. of Germany, assignors to VDO Adolf Schindling AG, Frankfurt am Main, Fed. Rep. of Germany

Filed Nov. 28, 1983, Ser. No. 555,859

Claims priority, application Fed. Rep. of Germany, Nov. 29, 1982, 3244103

Int. Cl.[4] F16K *1/226*

U.S. Cl. 251—305 **3 Claims**



1. A throttle valve connection piece with a throttle valve pivotally mounted in a passage of the connection piece, comprising

a connection piece housing having an inner wall forming a bore as said passage,

said throttle valve being pivotally mounted in said housing in said bore and having a closed position leaving a gap between said wall and an edge of said throttle valve with leakage air passing in the gap between the throttle valve and a portion of the wall of the bore when the throttle valve is in the closed position,

means for eddying said leakage air which passes in said gap between the throttle valve and said portion of the wall of the bore when the throttle valve is in the closed position,

said bore of said housing comprises a first bore and a second bore having a smaller diameter than said first bore and opening into said first bore at a level of said throttle valve in said closed position forming thereat a crescent-shaped step within said connection piece housing on one side of said bore of said housing, said eddying means further includes said crescent-shaped step, and

said wall on another side of said bore of said housing opposite said one side is formed with a reduction in cross-section comprising an arcuate transition to said second bore.

4,572,479

CAMERA TRUCK

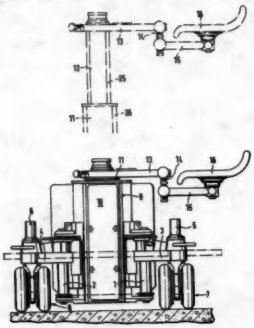
Karl Haberl, and Klaus Resch, both of Munich, Fed. Rep. of Germany, assignors to Film-Gerate-Vertieith Schmidle & Fritz, Munich, Fed. Rep. of Germany

Filed Jun. 19, 1984, Ser. No. 622,187

Claims priority, application Fed. Rep. of Germany, Jun. 23, 1983, 3322677

Int. Cl.[4] B66F *3/00*

U.S. Cl. 254—2 R **10 Claims**



1. In a camera truck having a vertical lifting column for vertical adjustment of the camera including a chassis, an outer column part resting on the chassis, an intermediate column part within and adapted to be extendable telescopically from said outer part, a central column part within and adapted to be extendable from the intermediate column part, each column part being substantially rectangular in cross-section and formed by interconnected walls, the camera being supported on the central column part, and guide wheels for guiding the column parts relatively to one another, the improvement comprising:

said column parts are spaced with respect to each other to provide spaces between adjacent walls;

elongated guide strips extending parallel to the longitudinal axis of said column and projecting transversely from the outer sides of the walls of said central and intermediate column parts into the respective spaces between said walls, each guide strip having two guiding surfaces;

wheel journals supported at one end in at least two walls of said column parts transversely with respect to said outer sides; and

a plurality of pairs of guide wheels rotatably mounted on said journals in said spaces between said adjacent walls with the axes of rotation of the guide wheels of each pair intersecting at a small acute angle of approximately 1° when the free ends of said journals are in an unloaded state wherein said guide wheels are disengaged from said guide strip so that each pair cooperatively engages both guiding surfaces of a respective guide strip to firmly and accurately guide the telescoping column parts during extension and retraction thereof.

4,572,480
HYDRAULIC PROP

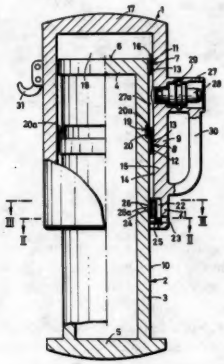
Peter Heintzmann, Bochum; Manfred Koppers, Duisburg; Friedel Amling, Gelsenkirchen-Buer, and Karlheinz Bohnes, Bochum, all of Fed. Rep. of Germany, assignors to Rochumer Eisenhuette Heintzmann GmbH & Co. KG, Bochum, Fed. Rep. of Germany

Filed Oct. 31, 1983, Ser. No. 548,075

Claims priority, application South Africa, Dec. 7, 1982, 82/8996

Int. Cl.[4] B66F *3/24*

U.S. Cl. 254—93 R **20 Claims**



1. An hydraulic prop for supporting barricades in blasting operations, comprising:

a pipe-shaped piston having an outer surface and a top end, with a top surface, and arranged to be supported on a support;

a pipe-shaped cylinder having a top end plate, and an inner surface without projections, said top end plate of said cylinder forming together with said top surface of said piston a pressure chamber, said cylinder being mounted on said piston so that said cylinder and said piston are displaceable relative to one another between extended and retracted positions;

a valve arranged to said pressure chamber, so as to define a fluid-wetted region of said piston and cylinder; and

upper and lower vertically spaced guide regions disposed at the upper end of said piston and consisting of only an upper and a lower circumferentially disposed annular collar both projecting from said outer surface of said piston and located in said fluid-wetted region, said upper annular collar of said piston forming together with said cylinder a passage for said hydraulic fluid to pass from said valve through said fluid wetted region to said pressure chamber, and said lower annular collar separating said fluid-wetted region of said piston and said cylinder from the atmosphere.

4,572,481
RELEASABLE CLAMPING ASSEMBLY FOR USE WITH HYDRAULIC JACKING APPARATUS

Henry B. Chambers, 1040 Debra Dr., Santa Barbara, Calif. 93110

Filed Oct. 14, 1981, Ser. No. 311,413

Int. Cl.[4] B66F *1/00*

U.S. Cl. 254—106 **6 Claims**

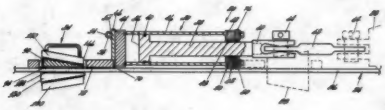
1. A hydraulic apparatus for moving a heavy load along a flanged member comprising

a hydraulic jacking cylinder;

clamping means operatively coupled to said hydraulic jacking cylinder for reacting the thrust force of the hydraulic jacking cylinder to the flanged member to advance the heavy load along the flanged member, said clamping means having

a jaw member having a channel-shaped cavity having opposed sloping walls forming a bearing surface; and

a ramp member and a ramp mating member positioned in opposed spaced relationship and having opposed sloping walls which are adapted to slidably engage said bearing surface, said jaw member being adapted to receive said thrust from said jacking cylinder and reacting in response thereto to apply a clamping onto and



urging said ramp plate and said ramp mating member toward each other to grip the flange and arrest the motion of the jacking cylinder relative to the flanged member; and

a plurality of load path members for transmitting the rotational force couple from the jacking cylinder directly to the flange such that a very small thrust load in the direction of travel applied to the clamping means will permit the opposed aligned ramp plate and the ramp mating member to move toward each other gripping the flanged member.

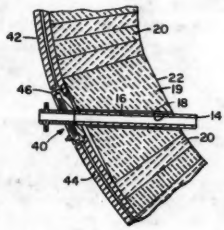
4,572,482
FLUID-COOLED METALLURGICAL TUYERE

Edward L. Bedell, Louisville, Ky., assignor to Corcliff Corporation, Boston, Mass.

Filed Nov. 19, 1984, Ser. No. 673,083

Int. Cl.[4] C21B *7/16*

U.S. Cl. 266—47 **20 Claims**



1. A fluid cooled tuyere for use in metallurgical furnaces which comprises:

a housing positionable exteriorly of a refractory wall of a metallurgical furnace;

said housing having a cooling chamber formed therewithin and a solid heat-sink wall extending from adjacent said chamber so as to project inwardly within wall portions of a metallurgical furnace;

means for supplying and circulating cooling fluid through said cooling chamber;

said heat-sink wall forming an inner wall of said housing, and an opposite wall, enclosing a portion of said cooling chamber, forming an outer wall of said housing;

tuyere tube means extending through said cooling chamber and outwardly of both said inner and outer walls of said housing;

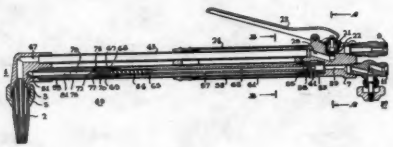
and said housing and said tuyere tube means being formed of a material having a thermal conductivity of at least about

2500 BTU/Ft^2/in. hr. °F. and a heat diffusivity greater than about 500 in.^{2}/hr.

4,572,483
CUTTING TORCH

Don J. Leu, Changhua Hsien, Taiwan, assignor to I Ling Industry Co., Ltd., Taipei, Taiwan

Filed May 30, 1984, Ser. No. 616,188
Int. Cl.^{4} B23K *7/00*
U.S. Cl. 266—48 19 Claims

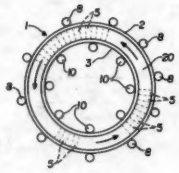


1. A cutting torch comprising:
a cutting head for receiving a removable cutting tip;
a valve body having an oxygen inlet, a fuel inlet, a cutting oxygen outlet, a preheat oxygen outlet, and a preheat fuel outlet communicating with said fuel inlet;
a cutting oxygen control valve for controlling the flow of oxygen from said oxygen inlet to said cutting oxygen outlet;
a preheat oxygen control valve for controlling the flow of oxygen from said oxygen inlet to said preheat oxygen outlet;
a cutting oxygen tube connecting said cutting oxygen outlet to said cutting head; and
a preheat tube connecting said preheat oxygen outlet and said preheat fuel outlet with said cutting head, said preheat tube including:
(i) an annular outer tube having a first end connected to said valve body and a second end connected to said cutting head;
(ii) an inner tube having an oxygen channel therein, said inner tube being disposed in said outer tube and defining a fuel channel therebetween, said inner tube having a first end sealingly connected to said valve body;
(iii) a nozzle fitting disposed in said outer tube and having a first end sealingly connected to a second end of said inner tube;
(iv) a mixer tube disposed in said outer tube and having a first end sealingly connected to a second end of said nozzle fitting, said mixer tube further being sealingly connected to said cutting head, and having a central bore therein and a plurality of transverse passageways disposed between said outer tube and said central bore, said passageways intersecting said central bore spaced at a predetermined distance from said first end of said mixer tube;
said oxygen channel in said inner tube being defined by a bore in said inner tube, said bore being of a first diameter remote from said second end of said inner tube and being of a second diameter adjacent said second end of said inner tube, said second diameter being greater than said first diameter;
(v) a heat absorbing metallic spiral disposed in said bore adjacent said second end of said inner tube, said spiral having a diameter greater than said first diameter of said bore;
said nozzle fitting having a bore therein in fluid communication with the bore in said inner tube and the central bore in said mixer tube, the diameter of the bore in said fitting being less than said second diameter, said fitting further having a blunt-nosed boss protruding from its second end into the central bore of said mixer tube, the length of said boss being less than said predetermined distance.

4,572,484
PALLET CONSTRUCTION FOR TRAVELING GRATE MACHINES

Stanley M. Coulter, Wexford, Pa., assignor to Dravo Corporation, Pittsburgh, Pa.

Filed Jul. 15, 1985, Ser. No. 755,187
Int. Cl.^{4} F27B *9/26*
U.S. Cl. 266—179 12 Claims



1. In a circular traveling grate machine of the type having continuous inner and outer, rotatable side frames in which one or both of the side frames are motor driven and having a plurality of pallets for movement along a pallet trackway positioned beteen the side frames, an improved pallet construction, wherein each pallet comprises:
a pallet frame having a leading end and a trailing end and a pair of spaced-apart lateral edges joining said ends;
a plurality of spaced-apart grate elements positioned on said pallet frame forming a gas permeable surface for supporting a burden thereon;
a pair of fixed, first axles and a pair of fixed, second axles, outwardly extending and spaced-apart on opposed lateral edges of the pallet frame;
a pair of hanger brackets each having a bushing end and a latching end, each of said hanger brackets pivotally connected at the bushing end to a first axle and fixedly attached to one of the inner and outer frames of the machine at the latching end;
a pair of pallet wheels, each rotatably mounted on one of the second axles for travel along the pallet trackway;
first restraining means associated with one of the hanger brackets for preventing relative movement between said one hanger bracket and its attached axle in a radial direction and in a circumferential direction, wherein the pallet trackway is substantially concurrent with and defines said circumferential direction, and said radial direction is substantially perpendicular thereto;
second restraining means associated with the other of said hanger brackets for preventing relative movement between said other hanger bracket and its attached axle in the circumferential direction and for permitting relative movement restrained within a predetermined distance in a radial direction; and
third restraining means associated with one of the pallet wheel axles and an adjacent side frame of the machine for preventing relative movement between said one pallet axle and adjacent side frame in a radial direction and for permitting relative movement restrained within a predetermined distance in a circumferential direction, whereby each of said pallets mechanically couple said inner and outer side frames together and transmit forces and moments to accommodate mismatched driving forces on the side frames and to accommodate dimensional variations in the pallets and side frames caused by thermal expansion and contraction.

4,572,485
APPARATUS FOR MELTING A MELTING STOCK COMPOSED OF SCRAP METAL AND/OR COARSE SCRAP MATERIAL

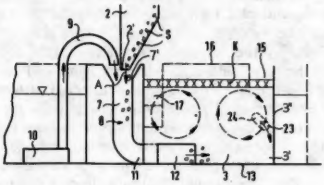
Franz Engelberg, Constance, Fed. Rep. of Germany; Luciano Fabris, Kreuzlingen, Switzerland; Robert Schneider, Jestetten, Fed. Rep. of Germany; Gerhard Villinger, Kreuzlingen, and Walter Truninger, Tägerwilen, both of Switzerland, assignors to Gautschi Electro-Fours SA, Tägerwilen, Switzerland

Filed Aug. 22, 1984, Ser. No. 643,050

Claims priority, application Switzerland, Aug. 25, 1983, 4636/83

Int. Cl.⁴ F27D *3/18*

U.S. Cl. 266—227 **12 Claims**



1. An apparatus for melting a melting stock comprising a desired one of fractured scrap metal, comminuted scrap metal, highly contaminated coarse scrap material rich in slag, or a mixture thereof in a bath of molten metal underlying a layer of slag, said apparatus comprising:

a melting furnace;

a primary melting chamber for the bath of molten metal;

said primary melting chamber having a substantially cylindrical portion;

a charging channel opening into said primary melting chamber for charging said primary melting chamber with the melting stock;

said charging channel comprising a substantially vertically extending first section and having an upper end;

said charging channel comprising a second section arranged subsequent to said substantially vertically extending first section and opening substantially tangentially into said primary melting chamber at said substantially cylindrical lower portion thereof for feeding said melting stock into said primary melting chamber so as to induce a vortex motion of the bath of molten metal in a rotary direction;

a charging bin for the melting stock arranged above said upper end of said charging channel;

a first tubular conduit having an outlet end and cooperating with said charging channel;

said outlet end of said first tubular conduit being arranged above said upper end of said charging channel;

a first pump for transporting the molten metal through said first tubular conduit to said charging channel

a slag removal channel connected to said primary melting chamber for removing slag therefrom;

said slag removal channel being substantially tangentially connected to said primary melting chamber at a height thereof where the layer of slag forms and in the rotary direction of the vortex motion;

a molten metal removal channel connected to said primary melting chamber for removing molten metal therefrom;

said molten metal removal channel being substantially tangentially connected to said primary melting chamber in a direction counter to the rotary direction of the vortex motion;

a second conduit opening into said primary melting chamber at a location above said second section of said charging channel for at least augmenting the vortex motion; and

a second pump for transporting molten metal substantially tangentially into said primary melting chamber in the rotary direction of the vortex motion.

4,572,486
MOLTEN METAL FILTERING VESSEL WITH INTERNAL FILTER

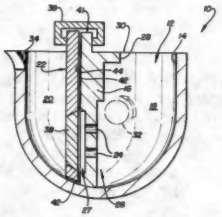
Daniel E. Groteke, Cincinnati, Ohio, and Avery L. Kearney, Valparaiso, Ind., assignors to Metcast Associates, Inc., Cincinnati, Ohio

Continuation-in-part of Ser. No. 398,406, Jul. 14, 1982, Pat. No. 4,444,377. This application Apr. 20, 1984, Ser. No. 602,507

The portion of the term of this patent subsequent to Apr. 24, 2001, has been disclaimed.

Int. Cl.⁴ C21C *7/04*

U.S. Cl. 266—229 **13 Claims**



1. A molten metal filtering vessel having an internal wall cavity;

a partition attaching to said wall separating said vessel into a first section and a second section;

at least one passage in said partition allowing said first section to communicate with said second section;

a blade positioned in said second section adjacent to said partition having a preformed contour to mate with said wall and having a passage therethrough;

said passage of said blade communicating with said passage of said partition; and

a filter element in said passage of said blade.

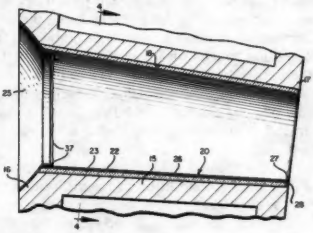
4,572,487
BLAST FURNACE TUYERE WITH REPLACEABLE LINER

William E. Slagley, Crown Point, Ind., assignor to Inland Steel Company, Chicago, Ill.

Filed May 10, 1984, Ser. No. 608,868

Int. Cl.⁴ C21B *7/16*

U.S. Cl. 266—270 **30 Claims**



1. In a blast furnace, the combination comprising:

a tubular, metallic tuyere including a main tubular portion having an inside surface and terminating at a downstream nose portion;

a tubular, metallic liner for said tuyere;

said liner having a main liner portion which fits within the

main portion of the tuyere and terminates at a downstream liner nose portion;

means on said liner cooperating with the tuyere for providing a gas-tight seal between said inside surface of the tuyere and said liner, without attaching the liner to the tuyere;

said means for providing the seal comprising a flange extending radially outwardly from the liner nose portion to a peripheral flange edge located a predetermined radial distance from the liner nose portion at ambient temperature, said flange being continuous around the periphery of the liner nose portion;

a plurality of layers of refractory fiber paper disposed around said main liner portion to a total paper thickness not substantially exceeding the radial dimension of said flange;

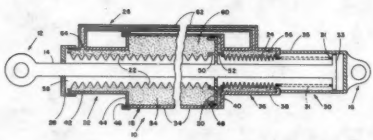
said layers of refractory fiber paper being sandwiched between said liner and said tuyere.

4,572,488

LOW TEMPERATURE RATE CONTROLLER

Arthur Holmberg, Jr., Cypress, and Earl M. Altman, Buena Park, both of Calif., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Dec. 8, 1983, Ser. No. 559,612
Int. Cl.[4] F16F *3/07, 9/36*
U.S. Cl. 267—8 R **1 Claim**



1. A rate controller for use in outer space, said rate controller comprising:

first housing means for containing a damping fluid, said first housing means having a left housing, a center housing, and a right housing, said housings hermetically connected together, said left and said right housing being shaped like a cylindrical tube with a brim thereon, said center housing being shaped like a cylindrical tube, said cylindrical tube of said center housing being connected to said left housing on said brim and said right housing on said brim;

second housing means for connecting said first housing means to a bracket attached to said second housing means, said second housing means fixedly attached to said right housing opposite to said brim thereon;

a piston, said piston in sliding contact with said center housing of said housing means, said piston having a sliding seal mounted circumferentially about said piston and in sealing contact with said center housing, said piston having mounting means on opposite sides thereof and centered thereon;

an actuator rod, said rod fixedly attached to said piston, said rod passing through said first housing means and connected to an eye bracket, said eye bracket connected to a workpiece;

a spring for biasing said piston, said spring being mounted within said second housing means, said actuator rod having a spring retaining bracket mounted thereon, said spring mounted between said spring retaining bracket and said first housing means;

a rod guide, said guide connected to said first housing means, said rod closely fitting through a hole centered in said rod guide;

bellow means for forming flexible gas impermeable walls, said bellow means attached to said piston and said left housing and said piston and said right housing, whereby left and right volumes are formed, said volumes being hermetically sealed from said external environment, said bellow means being a pair of metal bellows, one of said pair being a left bellows, said left bellows having said rod therethrough, one end of said left bellows being hermetically attached to said first housing means of said left housing, the other end of said left bellows being hermetically sealed to a left mounting means attached to said piston, the other of said pair being a right bellows, said right bellows having said rod therethrough, one end of said right bellows being hermetically attached to said first housing means of said right housing, the other end of said right bellows being hermetically sealed to a right mounting means attached to said piston, said left volume being hermetically sealed from said external environment, said left volume being defined by the external wall of said left bellows, said left housing, said center housing, and said piston, and said right volume being hermetically sealed from said external environment, said right volume being defined by the external wall of said right bellows, said right housing, said center housing, and said piston; and

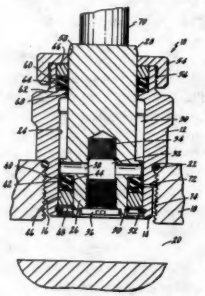
a fluid resistor, said fluid resistor connected between said left volume and said right volume whereby the movement of said piston causes said damping fluid to flow through said fluid resistor to resist rapid motion of said piston; said fluid resistor having a pneumatic line with an orifice therein to resist the flow of said damping fluid therethrough, said line being connected between said left and said right volumes, and said line being externally mounted to said first housing means.

4,572,489

NITROGEN DIE CYLINDER

Bernard J. Wallis, 25315 Kean Ave., Dearborn, Mich. 48124

Filed Jun. 14, 1984, Ser. No. 620,681
Int. Cl.[4] F16F *9/02*
U.S. Cl. 267—119 **1 Claim**



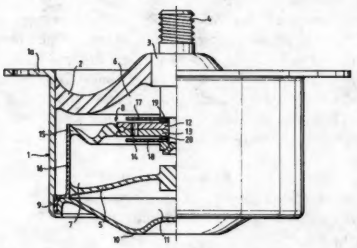
1. In combination, a pressurized nitrogen manifold for applying a biasing force to a die member that is axially displaceable in response to reciprocation of a ram of a press in which the die is mounted, a cylinder unit comprising a cylinder having a bore and an externally threaded open end sealingly connected with a threaded port on the manifold, a piston slideable axially in said bore, said piston having a rod on one end thereof extending axially outwardly through the opposite end of the cylinder, the free end of the rod being adapted to abut said die member, said rod having a diameter smaller than the diameter of the cylinder bore to thereby form an annular chamber between the rod and the bore, said piston having a central chamber therein in free communication with said annular chamber, said piston having an annular seal thereon slideably engaging the bore, said cylinder having an annular seal therein adjacent said opposite end thereof slideably engaging the outer periphery of the rod, said cylinder unit being arranged so that, as a result of the manifold pressure applied to the opposite end of the piston

through said port, the rod is biased outwardly of the cylinder to apply said biasing force on the die member and in response to movement of the press ram to a bottom dead center position at a lower end of each normal stroke, the piston is displaced in a direction inwardly of the cylinder against the bias of the manifold pressure to a predetermined partially retracted position, said piston also being movable to a fully retracted position inwardly beyond said predetermined position when the pressure in said annular chamber exceeds the pressure in the manifold and passageway means in the cylinder extending from said bore to the open end of said cylinder, one end of said passageway means intersecting said bore at a point on the rod side of the first-mentioned seal when the piston is in said fully retracted position and on the axially opposite side of said first-mentioned seal when the piston is in said partially retracted position, the opposite end of said passageway means communicating with the manifold through the threaded port thereon, whereby during normal operation of the ram, said passageway means is not effective to establish communication between said annular chamber and the manifold, but is effective to establish such communication when the manifold pressure is reduced to atmospheric.

4,572,490
SHOCK ABSORBING SUPPORT

Fiorenzo Alciati, Asti, Italy, assignor to Societa' Impianti Elettrici Telefonici Telegrafici e. Costruzioni Edili S.p.A., Florence, Italy

Filed Mar. 14, 1984, Ser. No. 589,637
Claims priority, application Italy, Mar. 15, 1983, 67289 A/83
Int. Cl.[4] F16F *9/08*
U.S. Cl. 267—140.1 **11 Claims**



1. A shock-absorbing resilient support for the suspension of a body to a support structure, particularly for the suspension of motor vehicle engines, motor lorry cabs, and the like, such support comprising:

a first metal attachment element (1) adapted to be fixed to the support structure;

a second metal attachment element (3) adapted to be fixed to the body to be suspended on the support structure;

a flexible body of elastomeric material (2) which connects the two metal elements (1, 3) together;

a resilient membrane (5) carried by the said first attachment element (1), which delimits, together with the elastomeric body (2), a closed cavity filled with a viscous fluid;

a dividing wall (8) within the said closed cavity which separates this cavity into first and second variable volume chambers (6, 7), this dividing wall (8) being provided with at least one passage for the transfer of viscous fluid from one chamber to the other upon relative displacements between the first and second attachment elements (1, 3); and wherein

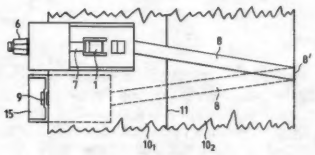
the said resilient membrane (5) delimits-on the side opposite the said cavity filled with viscous fluid-a third variable volume chamber (11) filled with gas under pressure and serving to support, at least in part, the weight of the suspended body,

wherein each said passage includes valve means for varying the overall flow cross-section which puts the first and second chamber (6, 7) into communication with one another in the event of relative displacements of low frequency and large amplitude between the first and second metal attachment elements (1, 3).

4,572,491
DEVICE FOR JOINING WOODEN OR METALLIC STRUCTURAL PARTS

Hans Forrer, Feldweg 854, Oberhelfenschwil, Switzerland

Filed Mar. 9, 1984, Ser. No. 588,041
Claims priority, application Switzerland, Mar. 10, 1983, 1431/83
Int. Cl.[4] B25B *1/20*
U.S. Cl. 269—43 **4 Claims**



1. A clamping device and workpiece combination comprising:

a pair of workpieces engaged to each other at a joint and each having a pair of outer corners spaced away form said joint and defining an outer edge spaced away from said joint, said engaged workpieces together having a top surface and a bottom surface;

a tensioning angle engaged over one outer corner of one workpiece, said tensioning angle having a first leg engaged against the outer edge of said one workpiece and a second leg engaged against said top surface of said engaged workpieces;

a holding angle engaged over the other outer corner of said one workpiece, said holding angle having a first leg engaged against said outer edge of said one workpiece and a second leg engaged against said bottom surface of said engaged workpieces, said holding angle having at least one slot therethrough;

a band having a first end portion extending through said slot of said holding angle with an anchoring block connected to said first end portion of said band, said block engaged against said holding angle with tensioning of said band, said band extending over said bottom surface, around said outer corners of the other workpiece, over said top surface and to a second end portion of said band;

band clamping means movably mounted to said tensioning angle for clamping said second end portion of said band to said tightening angle; and

band tensioning means connected to said tensioning angle and engaged with said band clamping means for moving said band clamping means on said tensioning angle to tension said band.

4,572,492
XYZ VISE

Mayuto Kawakita, Shizuoka, Japan, assignor to Sansin Kiko Co. Ltd., Shizuoka, Japan

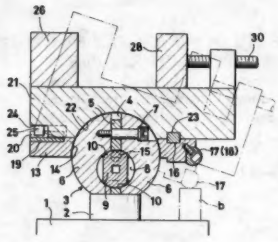
Filed Jul. 2, 1984, Ser. No. 626,985
Claims priority, application Japan, Jul. 16, 1982, 57-123017
Int. Cl.[4] B23Q *1/12*
U.S. Cl. 269—75 **21 Claims**

1. An XYZ vise comprising a spherical body consisting of two opposing hemispherical members and having a through-

hole of circular cross section passing along the opposing surfaces of said hemispherical members;

at least one magnetic shielding member intervening between said two hemispherical members;

a permanent magnet rotatably accommodated in said through-hole;



a reference plate mounted on said spherical body to be rotatable about the x-axis and the y-axis; and

a vise unit rotatably mounted on said reference plate;

whereby said reference plate and said vise unit can be selectively fixed on or released from said spherical body by rotating said permanent magnet.

4,572,493

UNIT HAVING DEGREES OF FREEDOM, SUCH AS A SURGICAL OPERATING TABLE

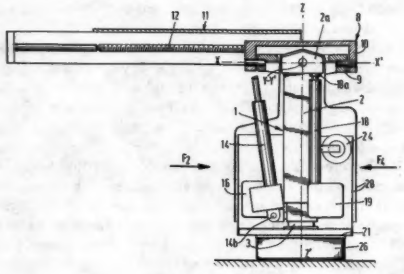
Jean Hubert, Paris, France, assignor to A L M, Le-Pre-Saint-Gervais, France

Filed Jun. 22, 1984, Ser. No. 623,331

Claims priority, application France, Jun. 30, 1983, 83 10828

Int. Cl.[4] A61G *13/00*

U.S. Cl. 269—325 **12 Claims**



1. A unit having multiple degrees of freedom, comprising a stand movable in rotation and in translation relative to a vertical axis, a universal joint having a first pivot axis and a second pivot axis which is perpendicular to said first pivot axis, a platform mounted by said universal joint on said stand, means for driving in rotation connected to the universal joint for pivoting said universal joint about said first and second axes and thereby pivoting said platform in a longitudinal plane about said first axis and in a transverse plane about said second axis, and means for driving in translation connected to said stand for moving said stand along said vertical axis, said means for driving in rotation comprising a pair of devices disposed on opposite sides of a first vertical plane containing one of said first and second axes, said devices being arranged to exert simultaneously on said universal joint selectively forces in the same direction and forces in opposite directions, said pair of devices being located on the same side of a second vertical plane containing the other of said first and second axes, said pair of devices comprising two jacks which are mounted in parallel and located at equal distances from said second plane and exerting on said universal joint forces of the same magnitude.

4,572,494

METHOD OF PROVIDING MULTIPLIED FORCE USING VERNIER MEMBERS AND PRY LEVER

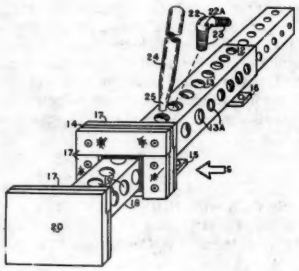
Victor H. Goulter, 485 Molimo Dr., San Francisco, Calif. 94127

Division of Ser. No. 266,500, May 22, 1981, Pat. No. 4,449,704.

This application May 22, 1984, Ser. No. 612,874

Int. Cl.[4] B25B *1/00*

U.S. Cl. 269—329 **4 Claims**



1. A method of multiplying force comprising the following steps:

(a) providing a pair of members, each having a plurality of separated passageways therealong, the passageways of one of said members having different spacings than those of the other of said members so that when said members are positioned adjacent each other with their respective passageways also adjacent each other, at least one pair of passageways of said respective members will be at least partially aligned so as to form a common passageway through said members,

(b) providing a lever having a tapered tip at one end thereof,

(c) inserting said one end of said lever into said common passageway so that said lever extends through both members of said pair, and

(d) moving the other end of said lever in a general arc about a fulcrum at the point where said lever passes through said members such that:

(1) said lever will first contact respectively opposite sides of said two passageways which form said common passageway, and then,

(2) said lever will press said respectively opposite sides of said two passageways in respectively opposite directions, such that

(i) said lever will pry each member against the other member and,

(ii) said members will thereupon be pried and forced to move with respect to each other into a different degree of alignment with multiplied force.

4,572,495

APPARATUS FOR LAYING WEB MATERIAL

Gunter O. Stumpf, Ostendstrasse 13, D-7432 Urach, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 412,262, Aug. 27, 1982, Pat. No. 4,516,760. This application Apr. 29, 1985, Ser. No. 728,263

Claims priority, application Fed. Rep. of Germany, Sep. 23, 1981, 3137876

Int. Cl.[4] B65H *29/46*

U.S. Cl. 270—31 **23 Claims**

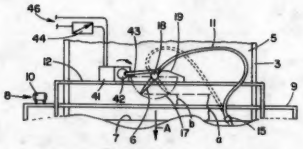
1. An apparatus for laying soft thin fabric, such as nylon,

woven goods, jersey, plush weave or the like on a flat laying surface for cutting, said apparatus comprising:

(a) a laying surface for receiving layers of fabric,

(b) a laying carriage which is moveable over the laying surface to deposit the fabric on the laying surface, the carriage having means to provide the fabric as a vertically suspended web from the laying carriage to the laying surface,

(c) at least one pivoting air nczzle mounted on the laying carriage at the end of a flexible air supply line for directing



air in a horizontal plane at the decending web material, said pivoting nozzle being pivotal over an angular range of approximately 180°,

(d) a mounting means for suspending the nozzle behind the suspended web with respect to the travel direction of the laying carriage during the laying of the fabric.

(e) means for pivoting the nozzle during the depositing travel of the laying carriage and thereby vary the angular speed of the nozzle as the speed of the laying carriage is varied.

4,572,496

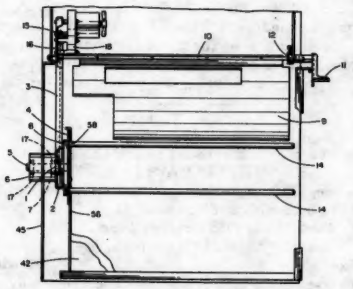
TRIM REWINDER WITH AUTOMATIC STOP

Mark S. Casper, Williamsville, and Robert I. Thomson, Pendleton, both of N.Y., assignors to Moore Business Forms, Inc., Grand Island, N.Y.

Filed Sep. 8, 1983, Ser. No. 530,201

Int. Cl.⁴ B65H *41/00*

U.S. Cl. 270—52.5 **4 Claims**



1. A waste paper trim rewinder comprising:

a frame;

waste paper trim rewind means including elongated members rotatably mounted on the frame for rewinding trim;

an open top waste paper bin removably mounted on the frame and adapted to strip the waste paper trim from the elongated members into the waste paper bin, upon removal of the waste paper bin;

the waste paper bin having a trim stripper portion defining a member opening for the elongated members, the elongated members extending through the member opening when the waste paper bin is mounted on the frame, the elongated members being movable through the member opening during removal of the waste paper bin, and the trim stripper portion being sized to strip the waste paper trim from the elongated members as the elongated members move through the member opening;

a compacting means including a pressure member movably mounted on the frame for compacting the waste paper trim on the elongated members;

the pressure member being a pressure plate pivotably mounted on the frame and adapted to wipingly press against waste paper trim on the elongated members to tighten the trim on the elongated members; and

means for sensing the position of the movable pressure member and controlling the rewind means in relation to said position;

the sensing and controlling means being for stopping the rewind means when the position of the pressure member corresponds to the trim rewinder being full of waste paper trim.

4,572,497

METHOD AND APPARATUS FOR COLLECTING FORM SHEETS IN A SET THEREOF

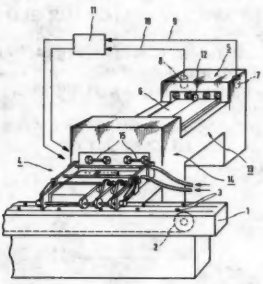
Jürgen Dreschel, Karben; Heinrich Möbs, Bad Nauheim, and Peter Hög, Rockenberg, all of Fed. Rep. of Germany, assignors to Bell & Howell Company GmbH, Fed. Rep. of Germany

Filed Dec. 20, 1984, Ser. No. 684,403

Claims priority, application Fed. Rep. of Germany, Sep. 12, 1984, 3433497

Int. Cl.⁴ B65H *39/02, 3/08*

U.S. Cl. 270—58 **20 Claims**



1. Apparatus for collecting sheets in a set thereof, said apparatus comprising:

two juxtaposed receiving stations adapted to receive juxtaposed incoming sheets; and,

means to transfer the contents of a first of said receiving stations to a second of said receiving stations in a direction which is transverse to the direction of incoming travel of the sheets to said apparatus, said transfer means comprising:

transverse conveyor means disposed in a first of said receiving stations adapted to be revolved through a course of travel, said conveyor means having perforations provided therein, an upper portion of said course of travel of said transverse conveyor means lying substantially in the plane of a sheet-supporting surface of said first receiving station;

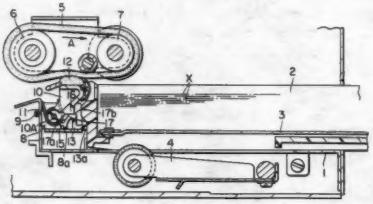
drive means for revolving said transverse conveyor means through its course of travel; and,

manifold means for communicating a source of vacuum to perforations in said transverse conveyor means as said transverse conveyor means is revolved proximate said manifold means.

4,572,498
SHEET FEEDER

Takao Shiozawa, Hachioji, Japan, assignor to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Sep. 27, 1983, Ser. No. 536,203
Claims priority, application Japan, Sep. 30, 1982, 57-171329
Int. Cl.[4] B65H 3/04
U.S. Cl. 271—34 15 Claims



1. In an apparatus for feeding and separating individual sheets from a stack of sheets comprising

a sheet feeding member, mounted in said apparatus, for sheet feeding engagement with said stack and

a means for preventing multiple feeding of said sheets,

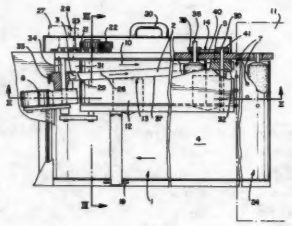
the improvement comprising

said means being capable of assuming an operative position and an inoperative position in direct response to an insertion and removal, respectively, of said stack.

4,572,499
PROCESS AND APPARATUS FOR REGISTERING SHEETS

Gaspar A. H. Bijttebier, Grote Heerweg 64, B- 8749 Waregem (Beveren Leie), and Jozef Vangheluwe, Roeselare, both of Belgium, assignors to Gaspar A. H. Bijttebier, Waregem-Beveren, Belgium

Filed May 29, 1984, Ser. No. 615,041
Int. Cl.[4] B65H 9/16
U.S. Cl. 271—251 20 Claims



1. An apparatus for registering flexible sheets, comprising:

(a) a ground supported frame;

(b) conveyor means having a smooth sheet contacting surface movably mounted to said frame and extending between an inlet end and an outlet end of said frame;

(c) movable abutment means mounted to said frame juxtaposed to said sheet contacting surface;

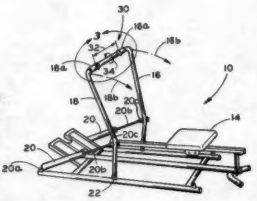
(d) drive means mounted to said frame and adapted for moving said conveyor means and said abutment means at subtantially equal speed whereby a flexible sheet deposited on said sheet contacting surface at generally said inlet end is engaged by and aligned with said abutment means during advancement between said inlet and said outlet ends and is thereby registered and

(e) flattening means mounted to said frame juxtaposed to said abutment means for maintaining said sheet flat during engagement with said abutment means.

4,572,500
ROWING EXERCISE DEVICE

Eugene Weiss, 937 Saw Mill River Rd., Yonkers, N.Y. 10710

Filed Jul. 23, 1984, Ser. No. 633,473
Int. Cl.[4] A63B 69/06, 21/14, 21/00
U.S. Cl. 272—72 3 Claims



1. In an exercise device of the type having a pivotally mounted pair of right and left exercise handles and a cooperating resistance cylinder operatively connected to each for requiring the exerciser to independently urge said said handle through a pivotal traverse against the resistance of each said resistance cylinder during the exercising use of said exercise device, the improvement comprising in each said exercise handle a hollow gripping end in opposing relation to each other when said exercise handles are in a starting position preparatory to being urged through said pivotal traverse, a cylindrical handle-uniting bar having opposite ends sized to be projected into said hollow gripping ends of said exercise handles and having such operative positions in said hollow gripping ends when in spanning relation between said exercise handles, a detent means in each projected end of said handle-uniting bar for establishing an engaged relation thereof to said exercise handles, and a slightly oversized cylindrically shaped additional gripping handle disposed over said handle-uniting bar and centered between said gripping ends of said exercise handles, whereby said additional gripping handle is adapted to be gripped in both hands of the exerciser and undergo counter-rotation to the direction of the pivotal traverse about said handle-unit bar, so as to contribute to obviating any slippage in the exerciser's grip thereof during said pivotal traverse.

4,572,501
EXERCISE DEVICE FOR ATTACHMENT TO A WHEELCHAIR

Claudia Durham, 778 Westover Dr., and Jeffrey E. Hopkins, 78 Fairfield Dr., both of, Danville, Va. 24541

Filed Jul. 1, 1983, Ser. No. 510,323
Int. Cl.[4] A63B 21/00; B62M 1/14
U.S. Cl. 272—73 5 Claims

1. An exercise device of the type which is removably attached to wheelchairs and used for exercising the limbs of disabled or partially paralyzed persons, said device comprising:

(a) a support frame having a horizontal portion and a vertical portion, both of said portions having height and length dimension balanced to the dimensions of the wheelchair for stability; said horizontal portion having a pair of guide wheels mounted on the leading end thereof, and a pair of drive wheels mounted a prescribed distance rearwardly from said guide wheels toward the wheelchair; said vertical portion extending substantially perpendicularly upwardly from a point near the rearward end of said horizontal portion adjacent the wheelchair when the device is connected to the chair;

(b) a pair of rotatable foot pedals mounted one on either side

of said horizontal portion and a pair of rotatable handle bars mounted one on either side of said vertical portion;

(c) means for operatively connecting said foot pedals to said handle bars such that rotation of either the foot pedals or handle bars imparts rotation to the other of said foot pedals or handle bars;

(d) means for operatively connecting said foot pedals and handle bars to said drive wheels on said exercise device;

(e) means for connecting said exercise device to the wheelchair;

(f) means for converting said exercise device and the wheelchair from a stationary operative position with said drive

wheels elevated from the ground, to a movable position with the drvie wheels engaging the ground wherein the device and the chair are mobilized by the person's use of the exercise device;

whereby the person confined to the wheelchair is positioned therein and when the exercise device is connected to the chair said vertical portion of said frame is substantially between the person's legs and adjacent the seat of the wheelchair such that said vertical portion aids in stabilizing the person during an exercise operation which may be mobile or stationary as related to simultaneous movement of the exercise device and the wheelchair.

4,572,502

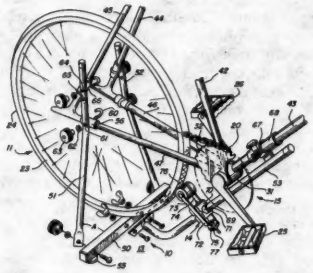
STAND FOR STATIONARY BICYCLING

Leonard E. Messineo, Glenview, Ill., assignor to All American Products, Inc., Gurnee, Ill.

Filed May 5, 1983, Ser. No. 491,892

Int. Cl.[4] A63B *21/00*

U.S. Cl. 272—73 **4 Claims**



1. A stand for supporting a bicycle for stationary bicycling on a supporting surface, said bicycle having a front wheel, a rear wheel and a frame interconnecting said front wheel and said rear wheel, wherein said stand comprises:

a base for engaging said supporting surface on both sides of the plane of rotation of said rear wheel,

a first substantially rigid brace having an upper portion and a lower portion wherein the lower portion is attached to said base on a first side of said plane of rotation and the upper portion lies generally parallel to said plane of rotation and is attached to said frame by an adjustable, releasable means adapted to be attached at at least two generally vertically spaced points on said first side of said plane of rotation,

a second substantially rigid brace having an upper portion and a lower portion wherein the lower portion is attached to said base on a second side of said plane of rotation and is attached to said frame by an adjustable, releasable means adapted to be attached at at least two generally vertically spaced points on said second side of said plane of rotation, and

a third substantially rigid brace having a first portion and a second portion, said first portion being connected to and extending beneath and generally parallel to a central portion of said frame and said second portion being connected to said base.

4,572,503

PIVOTAL SKIPPING ROPE HANDLES HAVING SPRING RESISTANCE

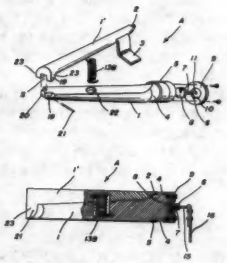
Cho Myung Ho, 205-153, Cheongryang 2-Dong, Dongdaemoon-Ku, Seoul, Rep. of Korea

Filed Feb. 15, 1983, Ser. No. 466,983

Claims priority, application Rep. of Korea, Jan. 17, 1983, 1983-329

Int. Cl.[4] A63B *5/20, 21/30*

U.S. Cl. 272—75 **4 Claims**



1. A handle of a skipping rope comprising:

a first handle member being substantially semicircular in cross section and having a first end, a gripping portion and a second end;

a second handle member being substantially semicircular in cross section and having a first end, a gripping portion and a second end;

connecting means for pivotally connecting said first end of said first handle member to said first end of said second handle member;

spring means operatively positioned between said first and second handle members for biasing said handle members away from each other and for providing a resistance for an individual grasping said handle members and attempting to compress said handle members together;

supporting means rotatably mounted relative to the second end of at least one handle member, including means for attaching a jump rope to said at least one handle member; and

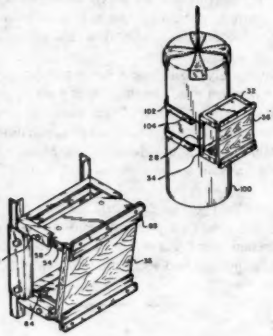
retaining means operatively mounted adjacent to the second end of at least one handle member for retaining said first handle member relative to said second handle member and forming a substantially circular handle.

4,572,504

HOLDER FOR BREAKABLE KARATE BOARD

Alfred DiBartolo, 8217 Corbett Ave., Pennsauken, N.J. 08109

Filed Dec. 6, 1984, Ser. No. 678,835
Int. Cl.[4] A63B *69/00*
U.S. Cl. 272—76 **5 Claims**



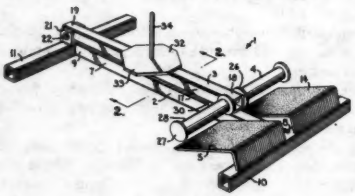
1. A holder for breakable karate boards comprising:
an upper substantially horizontal frame member;
a lower substantially horizontal frame member vertically spaced from said upper frame member;
each of said frame members having a rear end secured to a vertical support and a forward front free end;
the free forward end of said upper frame member having a first downwardly open elongated track and the free end of said lower frame member having a second upwardly open elongated track generally facing said first track;
said first and second tracks being adapted to support at least one breakable karate board in a substantially vertical position, and
means allowing said first and second tracks to be moved rearwardly and forwardly relative to each other so as to tilt a board being supported therein either upwardly and inwardly or downwardly and inwardly and including means for locking said tracks in relative position to each other.

4,572,505

WEIGHTED FOOT EXERCISER

Donald C. Kornhaus, 522 Willow St., Ottawa, Kans. 66067

Filed Dec. 27, 1983, Ser. No. 565,891
Int. Cl.[4] A63B *23/04*
U.S. Cl. 272—96 **5 Claims**



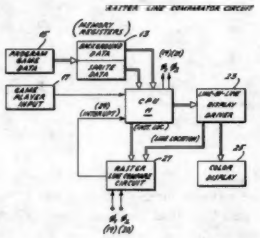
1. A lower leg exercising device comprising:
(a) a fixed frame including a longitudinal frame member and front and rear frame end members extending transversely, said fixed frame generally lying flat upon a floor;
(b) spaced foot rests mounted to said front end member and having a foot supportive surface inclined toward said rear end member; said foot rests being spaced about said longitudinal frame member; and having a lever arm and pivot means extending from said rear end member; said lever arm being rotatable toward and away from said longitudinal frame member;
(d) foot engaging bars with rotative sleeves thereon extending transversely from said lever arm generally adjacent said front end member; said bars being spaced from said foot rests a distance sufficient for a foot to be positioned therebetween whereby when said foot is flexed, said arm arrangement swings upwardly; and
(e) a weight holder positioned intermediately on said lever arm and including an upright shaft for receiving disc weights.

4,572,506

RASTER LINE COMPARATOR CIRCUIT FOR VIDEO GAME

David W. DiOrio, Easton, Pa., assignor to Commodore Business Machines, West Chester, Pa.

Filed Jun. 3, 1983, Ser. No. 500,981
Int. Cl.[4] A63F *9/22*
U.S. Cl. 273—1 E **9 Claims**



1. A circuit incorporated into a video game device which generates a color display on a raster line basis comprising:
a processor unit, said processor unit providing first and second non-overlapping clock pulses;
a display driver connected to receive signals from said processor unit;
a color display connected to receive signals from said display driver;
a stored program of data for both background display and SPRITE display;
a plurality of memory registers connected to hold said background display data and SPRITE display data, on a vertical address raster line, said memory registers being connected to said processor unit and holding in one register background data and in another register SPRITE data;
comparator circuit means for comparing instantaneous raster line information from a connection to said display driver and raster line location instruction for SPRITE display from a connection to said processor unit, said comparator means providing an interrupt signal to said processor to instruct said processor from processing background display data to processing SPRITE display data, said comparator circuit means also being connected to said processor first and second non-overlapping clock pulses;
wherein said comparator means includes:
a first isolation switch gatable for passing a said line location instruction from said processor on said first clock pulse;
a first register to store said line location instruction and the inverse thereof, said line location instruction being connected to said first isolation switch;
second and third isolation switches gatable on said second clock pulse, and connected to selectively pass said line location instruction and the inverse of said line location instruction, respectively, from said first register; and
a comparator device connected to said second and third isolation switches, said comparator device being connected to receive instantaneous line information from said

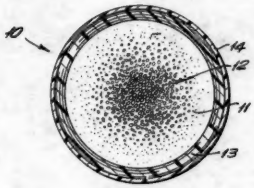
display driver, the output of said comparator being connected to said processor.

4,572,507

GAME BALL

David W. Hubbert, Perkasie, Pa., and Bobby L. Robinson, Vidalia, Ga., assignors to Athlone Industries, Inc., Parsippany, N.J.

Continuation-in-part of Ser. No. 551,828, Nov. 15, 1983, abandoned. This application Jan. 11, 1984, Ser. No. 569,856
Int. Cl.[4] A63B *37/00, 37/02*
U.S. Cl. 273—60 R 20 Claims



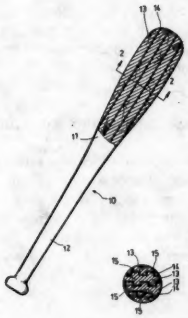
1. A ball having a cover and core, said core comprising a spherical center and a winding wherein said center comprises at least 45% of a partially blown copolymer of at least one olefin with at least one unsaturated monocarboxylic acid and said winding is impregnated with a latex based adhesive, and said winding being heat fused to the spherical center.

4,572,508

COMPOSITE LAMINATED BASEBALL BAT

Chin-San You, No. 3, La. 1029, Fong-Shih Rd., Fong Yuan City, Taiwan

Filed Nov. 14, 1984, Ser. No. 671,269
Int. Cl.[4] A63B *59/06*
U.S. Cl. 273—72 R 3 Claims



1. A baseball bat comprising: a hitting portion and a tapered grip end, said bat being made of a plurality of wooden laminations, said laminations having surfaces on which are disposed interlocking means for joining the plurality of laminations together to form said bat, said interlocking means extending from said grip to said end hitting portion and being non-uniform in cross-section;

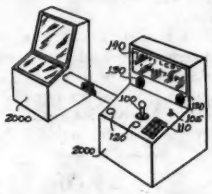
said bat further comprising at least one reinforced plastic layer interposed between said wooden laminations.

4,572,509

VIDEO GAME NETWORK

David H. Sitrick, 820 Burchell Ave., Highland Park, Ill. 60035

Filed Sep. 30, 1982, Ser. No. 431,154
Int. Cl.[4] A63F *9/22*
U.S. Cl. 273—85 G 47 Claims



1. A video game network system comprising:

a plurality of individual user apparatus, each said apparatus locally providing user input means for providing user signals, memory for storing game and display data, control means for logically sequencing through one of a plurality of predetermined audiovisual works responsive to said memory and said user signals, and display means for providing one of said plurality of audiovisual presentations to said control means;

a master controller comprising means for coordinating a multi-user interactive video game including providing for local audiovisual presentations responsive to the plurality of user input apparatus, including means for communicating change data among the master controller and all selected ones of said user apparatus.

4,572,510

BINGO INDICATOR

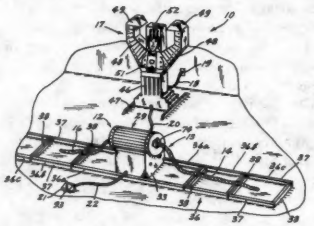
Ronald Green, 282 Thunder Cir., Bensalem, Pa. 19020

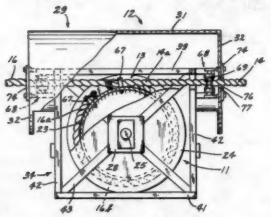
Filed Nov. 7, 1984, Ser. No. 670,215
Int. Cl.[4] G09F *21/02*
U.S. Cl. 273—148 R 11 Claims

1. A bingo indicator including a vertically elongated hollow and lightweight housing including top and bottom walls and a plurality of interconnected sidewall portions extending between and connecting said top and bottom walls, at least one of said sidewall portions having indicia thereon indicating a winning bingo game situation, said bottom wall including an integral downwardly opening depending tubular neck opening upwardly into the interior of said housing, an elongated wand including upper and lower ends, said wand being slidingly telescopingly received through said neck and shiftable relative thereto between a retracted position substantially fully upwardly telescopingly received within said housing with only the lower terminal end portion of said lower end projecting

downwardly below said neck and an extended position with the upper terminal end portion of said wand disposed in said neck and the remaining portions of said wand disposed therebelow projecting downwardly from said neck, said upper and lower terminal end portions of said wand being slightly enlarged in cross-sectional dimension relative to the cross-sectional dimension of the mid-length portion of said wand extending between said upper and lower terminal end portions with said mid-length portion being freely slidable through said neck and said terminal end portions being somewhat tightly slidingly receivable in said neck, whereby said wand is frictionally retained in the retracted position as well as the extended position thereof and may slide freely relative to said neck between said retracted and extended positions.

4,572,511
TUG-OF-WAR GAME
Jack E. Barringer, 1315 Big Blue Stem Ct., Ames, Iowa 50011
Filed Oct. 3, 1984, Ser. No. 657,756
Int. Cl.[4] A63B *21/28, 69/00*
U.S. Cl. 273—1 GC **5 Claims**





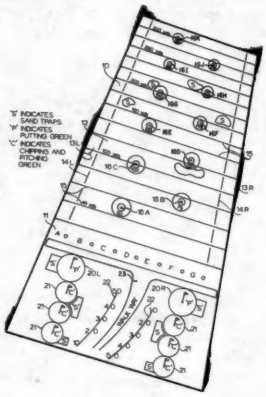
1. A tug-of-war game comprising:

(a) means rotatably mounted on a frame, said frame adapted to be stationary ;

(b) elongated means attached to said rotatable means and having one portion adapted to extend away from said rotatable means in one direction and a second portion adapted to extend away from said rotatable means in an opposite direction, said elongated means having a first condition wherein said portions are at midpoint relative to said movably mounted means, a second condition wherein the extension of said one portion is greater than the extension of said second portion, and a third condition wherein the extension of said second portion is greater than the extension of said one portion said rotatable means includes a single rotatable drum to which an inner end of each said portion is attached, and about which each said portion is wrapped upon rotation of said drum, said drum being rotatable in either direction more than 360° in response to either of said portions being pulled away from said drum at substantial right angles to the axis of rotation of said drum; and

(c) means for responding visibly to each of said elongated means conditions.

4,572,512
GOLF COURSE
Harold G. Tegart, 9147 Foothill Blvd., Sunland, Calif. 91040
Filed Sep. 30, 1982, Ser. No. 431,567
Int. Cl.[4] A63B *69/36, 67/02*
U.S. Cl. 273—176 A **9 Claims**



1. A compact golf course comprising;

a layout including a fairway region;

a plurality of tee areas directed toward said fairway region for use by players at said plurality of tees;

a plurality of range markers on the fairway to denote distance driven from the tees;

a plurality of targets on said fairway region at varying distances from said tees to act as targets in tee and fairway shots;

a plurality of hazards on said fairway;

at least one chipping green for completing fairway play by chipping to a green;

a plurality of range markers spaced from the chipping green for the player to place his ball the remaining distance from the green equal to his closest distance from his last fairway shot to the appropriate target; and

at least one putting green including a cup for putting after reaching the green;

a plurality of television cameras directed at different portion of said fairway;

a television monitor in communication with said television cameras and located at at least one of said tee areas and visible by the players using said tee area for monitoring the distance and flight of balls driven from the tee area and a selector switch at said at least one tee for selecting the television camera scene to be displayed on said monitor.

4,572,513
EDUCATIONAL GAME HAVING PRE-RECORDED QUESTIONS AND ANSWERS
R. Evan Evans, Largo, Fla., assignor to Eva-Tone Soundsheets, Inc., Clearwater, Fla.
Filed Aug. 8, 1983, Ser. No. 520,947
Int. Cl.[4] A63F *3/00*
U.S. Cl. 273—242 **1 Claim**

1. An educational game comprising:

a game board having a top face;

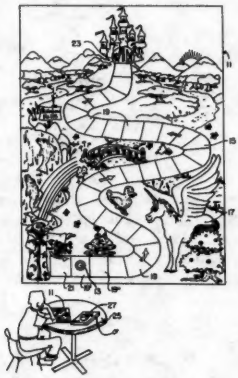
a game piece; and

an audio recording,

said top face having a path thereon comprised of a series of connected squares;

said game piece being designed and arranged such that it can be picked up and moved by a child and such that it can be set within the outlines of each of said squares,

said audio recording having a number of questions and answers to said questions recorded thereon,



each of said questions being followed by said answer to said question on said audio recording;

wherein said questions and said answers are recorded on one side of the audio recording; and

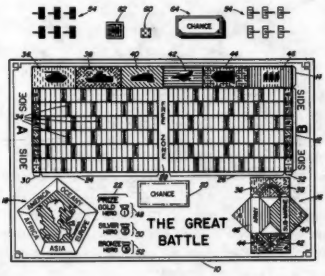
wherein there are the same number of said squares as there are number of said questions recorded on said one side of the audio recording.

4,572,514

MILITARY BOARD GAME

Guillermo Aponte, Presidente Gonzalez #14 Ens. Naco, Santo Domingo, Venezuela

Filed Mar. 24, 1983, Ser. No. 478,299
Int. Cl.⁴ A63F *3/00*
U.S. Cl. 273—255 **8 Claims**



1. A military board game comprising

a game board, said board having a movement portion marked with a multiplicity of columns, each said column being marked into a multiplicity of spaces and each column having uniquely associated with it indicia of a type of military force, said movement portion being marked into two opposing territories separated from each other by a free space, some of said spaces in each said columns being designated as "chance" spaces,

a multiplicity of playing pieces, each said piece being uniquely marked with corresponding indicia of one said type of miltary force, each said piece being restricted to movement along the corresponding marked column

two dice which, when thrown, together determine the initial movement of said pieces, each face of one said die being uniquely marked with corresponding unique indicia of one said type of military force and each face of the other said die being marked with a number, the throw of said dice determining which of said playing pieces to move, which column it is to be moved in, and the initial number of said spaces it is to be moved in said column,

instruction cards, one said card being drawn each time the initial movement of one of said playing pieces as determined by the roll of said dice ends on one of said "chance" spaces,

each movement of said playing pieces having a first phase controlled by the throw of said dice and a possible second phase controlled by the instructions on said instruction cards,

a single continent block separate from said movement portion, said block being marked with indicia of different continents to which playing pieces proceeding in either direction along the column of said board are moved to indicate success of said piece in moving through the opposing territory, and

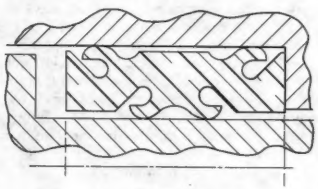
an award-identification chart, said chart identifying different prizes awarded for successfully moving different numbers of playing pieces to said continent block.

4,572,515

BIDIRECTIONAL SEAL WITH WIDE TEMPERATURE RANGE

Angel J. Grazioli, Beziers, France, assignor to Cameron Iron Works, Inc., Houston, Tex.

Filed Mar. 7, 1985, Ser. No. 709,137
Claims priority, application France, Feb. 7, 1985, 85 40020
Int. Cl.⁴ F16J *15/24, 15/32*
U.S. Cl. 277—12 **5 Claims**



1. A birectional sealing element for sealing between two parallel spaced apart cylindrical surfaces including an inwardly facing outer surface and an outwardly facing inner surface comprising

a resilient sealing ring having a central mass and side masses integral with and on either side of said central mass,

inner sealing means extending from the inner side of said sealing ring, and

outer sealing means extending from the outer side of said sealing ring,

said sealing ring and said inner and outer sealing means being sized to have both of said sealing means in sealing engagement with said inner and outer cylindrical sealing surfaces respectively,

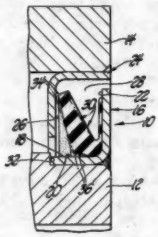
said side masses having a smaller internal diameter than said central mass so that on contraction by cooling said inner cylindrical surface limits the radial contraction of said side masses and said central mass is free to contract,

said outer sealing means being arranged to be urged into tight sealing engagement with the outer cylindrical surface responsive to contraction of said central mass while said side masses are supported against contraction.

4,572,516
LOW FRICTION DYNAMIC SEAL ASSEMBLY WITH CENTRIFUGAL DEFLECTION

James D. Symons, Southfield; Ronald J. Dershem, Davisburg, and Arnold O. DeHart, Rochester, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Jun. 12, 1985, Ser. No. 743,915
Int. Cl.[4] F16J 15/32
U.S. Cl. 277—50 3 Claims



1. A low friction dynamic seal assembly for sealing between a pair of members, one of which is rotatable about an axis,

a seal case fixable to said rotatable member and having a surface with a substantially cylindrical portion coaxial to said members and a radial portion generally normal thereto,

a sealing surface on the other member spaced from said seal case surface to define a seal space limiting the length of a seal body to be bonded to said seal case surface, and

a flexible seal body having a thickness sufficient to give inherent circumferential stability thereto during rotation and having a length extending from said seal case surface to a lip engagable with said sealing surface, said lip engaging said sealing surface to provide a frictional load thereon when said seal case is fixed to said rotatable member to deflect said seal body an initial amount toward one of said seal case surface portions and away from the other, said seal body being selectively bonded substantially only to said one seal case surface portion to create a hinge therewith of controllable resistance to said initial deflection of said seal body,

whereby the frictional load of said lip on said sealing surface caused by said initial deflection is reduced due to said selective bonding at low speeds of rotation, and whereby said seal body may be further deflected about said hinge under the centrifugal force of rotation an additional amount, thereby further reducing seal friction at higher speeds of rotation, also due to said selective bonding.

4,572,517
LABYRINTH RING SEALS WITH HOUSING MOUNTING MEANS

Robert E. Rockwood, Windham; Richard P. Antkowiak, Hampstead, both of N.H., and Douglas J. Hill, York Beach, Me., assignors to A. W. Chesterton Company, Stoneham, Mass.

Filed Jul. 26, 1985, Ser. No. 759,469
Int. Cl.[4] F16J 15/18, 15/447
U.S. Cl. 277—53 13 Claims

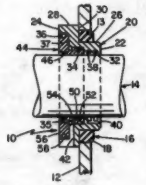
1. A ring seal, for sealing between a housing and a shaft, comprising stationary and rotary sealing rings;

said stationary sealing ring adapted for mounting about a shaft and having an outer diameter at one end sized to fit into a housing opening of predetermined substantially equal diameter, said stationary sealing ring having an inner wall closely adjacent the predetermined position of a shaft extending therethrough, said inner wall having at least one groove about the inner circumference thereof, and said stationary sealing ring having an enlarged inner wall section at the other end thereof having an inner diameter sized to receive said rotary sealing ring therewithin; and

said rotary sealing ring adapted for mounting on a shaft and having at least one groove about the outer circumference thereof;

characterized in that:

said rotary sealing ring has an outer diameter substantially equal to the inner diameter of said enlarged inner wall



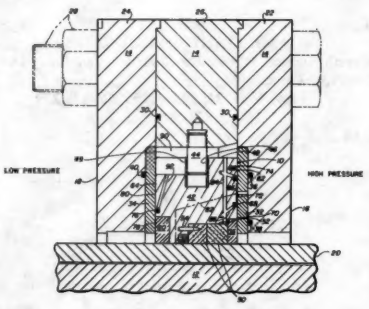
section of said stationary sealing ring at said other end thereof and has an axial length no greater than the axial length of said enlarged inner wall section at said other end of said stationary sealing ring;

said rotary sealing ring being contained within said stationary sealing ring.

4,572,518
LEAK FREE FLOATING PACKING SHAFT SEAL

John D. Spargo, Annapolis; A. Bayne Neild, Severna Park, and Martha M. Phillips, Arnold, all of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 31, 1984, Ser. No. 666,938
Int. Cl.[4] F16J 15/28
U.S. Cl. 277—75 11 Claims



1. A leak free floating packing shaft seal for use between a rotatable shaft and a supporting annular structure, the supporting structure having a high pressure upstream side and a low pressure downstream side, the floating seal comprising:

an annular holder slidably mounted in the supporting structure for radial movement therein;

a ring of packing material mounted in a recess in the inner circumferential side of the holder;

first O-ring means mounted between the supporting structure and the upstream side of the holder for effecting a seal from the high pressure environment;

second O-ring means mounted between the supporting structure and the downstream side of the holder; and

means communicating with the upstream and downstream sides of the holder for balancing the pressures therebetween;

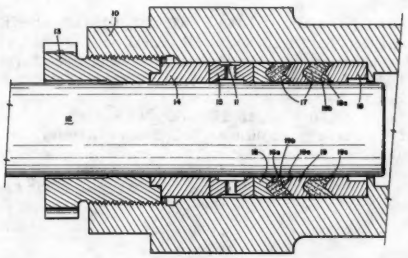
whereby the holder is free for said radial movement without leakage and the detriment of lateral forces thereon.

4,572,519

PACKING ASSEMBLY FOR USE IN A PLUNGER BORE

Donald C. Cameron; Homer V. Cobb, and Fred M. Winn, all of Tulsa, Okla., assignors to Dowell Schlumberger Incorporated, Tulsa, Okla.

Filed Jun. 14, 1984, Ser. No. 620,668
Int. Cl.[4] F16J *15/16*
U.S. Cl. 277—124 **4 Claims**



1. A packing assembly which is adapted to be installed in a machine, such as a pump, the machine having a housing with a plunger bore and a plunger therein to provide a fluid-tight seal for the machine, the assembly comprises:

a packing gland which fastens into one end of the plunger bore;

a packing gland spacer positioned adjacent to and in contact with the packing gland;

a lubrication gland positioned adjacent to and in contact with the packing gland spacer;

a separate stack of packing rings, which includes at least two packing rings, each ring in the stack has a front face defining a concave shape, a rear face defining a convex shape, and a groove, defining a concave shape, in the front face;

a female adaptor ring positioned between the lubrication gland and the packing ring stack, the female adaptor ring has a front face with a concave shape, the concave shape defines an angle which substantially conforms to the angle defined by the convex shape of the rear face of the last packing ring in the stack, such that the front face of the female adaptor ring can seat firmly against the rear face of the last packing ring;

a male-female adaptor ring positioned between two packing rings in the stack, the male-female adaptor ring has a front face and rear face, the rear face has a convex shape and an integral rib member defining a convex shape, on said rear face, and the front face has a concave shape:

the convex shape of the rear face of the male-female adaptor ring defines an angle which substantially conforms to the angle defined by the concave shape of the front face of the last packing ring in the stack and the convex shape of the face of the last packaging ring in the stack and the convex shape of the rib member substantially conforms to the concave shape of the groove in the front face of the last packing ring, such that the rear and the integral rib member of the male-female adaptor ring are able to seat firmly against the front face and groove, respectively, of the last packing ring in the stack:

the concave shape of the front face of the male-female adaptor ring defines which substantially conforms to the angle defined by the convex shape of the rear face of the first packing ring in the stack, such that the front face of the male-female adaptor ring can seat firmly against the rear face of the first packing ring;

substantially flat sealing surfaces between the front face and rear face of each of the sealing rings forming seals with the plunger bore and the plunger,

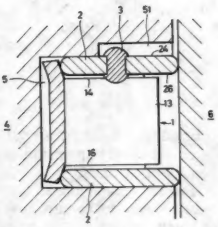
a male adaptor ring positioned in front of the first packing ring in the stack, the male adapter ring has a rear face with a convex shape, and an integral rib member, with the convex shape, on said rear face, the convex shape of the rear face of the male adaptor ring defines an angle which exactly conforms to the angle defined by the concave shape of the front face of the first packing ring, and the convex shape of the rib member exactly conforms to the concave shape of the groove in the front face of the first packing ring, such that the rear face and the integral rib member of the male adaptor ring are able to seat firmly against the front face and groove, respectively, of the first packing ring the male adaptor's and male-female adaptor's convex rear shape, their rib members and the complementary front concave faces and grooves of the packing rings forming means for keeping the packing rings concentric with the bore and the sealing surfaces of the packing rings in a sealed relationship with the plunger bore and the bore.

4,572,520

MULTI-COMPONENT STEEL PISTON RING WITH ROTATION PREVENTING RIVET

Masatoshi Shinada, Saitama, Japan, assignor to Nippon Piston Ring Co., Ltd., Tokyo, Japan

Filed Jul. 12, 1985, Ser. No. 754,297
Claims priority, application Japan, Jul. 18, 1984, 59-107641[U]
Int. Cl.[4] F16J *9/06*
U.S. Cl. 277—140 **5 Claims**



1. A piston ring disposed to fit within the annular groove of a piston, said piston ring comprising:

a circular, radially-corrugated expander-spacer having corrugations defining openings in said expander-spacer;

an upper annular ring member disposed adjacent the upper surface of said expander-spacer, said upper ring member having a headed rivet passing therethrough with an upper head projecting above said upper surface of said upper ring member and a lower head projecting below the lower surface of said upper ring member, said lower head projecting into one of said openings defined by said corrugations in said expander-spacer, said upper head of said rivet being disposed to engage a groove in said piston such that said upper ring member is prevented from rotating with respect to said piston; and

a lower annular ring member disposed adjacent the lower surface of said expander-spacer.

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T-SEAL FOR POLYMERIC EXTRUSION SYSTEM

Adrian D. Drost, Roswell, Ga., and Edward H. Ruscher, Appleton, Wis., assignors to Kimberly-Clark Corporation, Neenah, Wis.

Filed Aug. 23, 1984, Ser. No. 643,570
Int. Cl.[4] F16J *15/08*
U.S. Cl. 277—167.5 **5 Claims**

1. In a multiple component assembly for delivering a fluid material under pressure including:

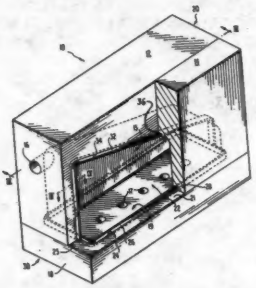
a lower fluid material container section having a cavity formed therein and at least one outlet orifice formed in an

outlet surface of the lower fluid material container section and communicating with said cavity;

an upper fluid material container section formed in at least two parts arranged in juxtaposed mating relationship and defining a cavity therein, one of said juxtaposed parts having a fluid material inlet in an inlet surface, said inlet communicating with the cavity in said upper fluid material container, said upper fluid material container section mounted in superposed mating relationship to said lower fluid material container section and the upper fluid material container cavity communicating with the lower fluid material container cavity to define a fluid material chamber;

first sealing means provided between the mating surfaces of said lower fluid material container section and said upper fluid material container section surrounding said fluid material chamber; and

second sealing means provided between each of said at least



two parts of said upper fluid material container section adjacent the cavity in said upper fluid material container, the improvement comprising:

said first sealing means comprising an endless ribbon-shaped sealing member having its narrow edge portions inserted in commensurately shaped endless grooves formed in each of said mating surfaces of said upper and lower fluid material container sections arranged surrounding said fluid material chamber; and

said second sealing means comprising a ribbon-shaped sealing member of finite length having its narrow edge portions inserted in grooves formed adjacent the upper fluid material cavity in each of said mating surfaces of said at least two parts of said upper fluid material container section, each of said grooves in said first and second sealing means having a chamfer provided on an outer portion thereof, each end of said second sealing member overlappingly contacting said first sealing member to form a fluidpressure tight seal.

4,572,522

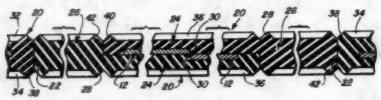
INTERLOCKING SECTIONAL GASKET ASSEMBLY AND METHOD OF MAKING SAME

Leonard J. Smagatz, Riverwoods, Ill., assignor to Felt Products Mfg. Co., Skokie, Ill.

Filed May 6, 1985, Ser. No. 730,585

Int. Cl.⁴ F16J *15/12;* B65D *53/00*

U.S. Cl. 277—199 **30 Claims**



1. A sectional gasket assembly made of at least two gasket sections, each said section having a first end providing a first connecting element of a given configuration and including a first button and a first opening, and having a second end providing a second connecting element of the same configuration and including a second button and a second opening, the first button and first opening of a first gasket section being juxtaposed and adapted to sealingly mate respectively with an opening and button of a second gasket section to provide a sealed joint thereat.

4,572,523

SEALING JOINT AND RETAINING RING FOR PIPE GROOVED BELL AND STRAIGHT SPIGOT JOINT

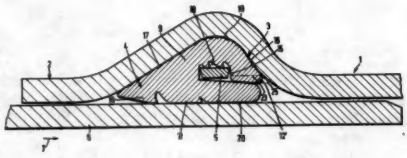
Ali Guettouche, Geeste, Fed. Rep. of Germany, and Bernhard Lodder, Hardenberg, Netherlands, assignors to Wavin B.V., Zwolle, Netherlands

Filed Jul. 15, 1983, Ser. No. 513,999

Claims priority, application Fed. Rep. of Germany, Jul. 17, 1982, 3226875

Int. Cl.⁴ F16J *15/06;* F16L *55/00*

U.S. Cl. 277—207 A **19 Claims**



1. A first pipe member having a socket formed by an end portion thereof and a radially outwardly directed annular groove in the wall of the pipe member end portion, a sealing ring of resiliently deformable material disposed inside the pipe member end portion in the groove and a retaining ring received within an internal recess in the packing ring, said packing ring having an outer peripheral portion formed to fit within the pipe member wall defining the groove and front and rear projections situated respectively axially in front of and behind the retaining ring to the side thereof adjacent the open end of the socket, said front projection having an inner sealing lip (20) extending rearwardly from said front projection (11) towards the rear projection (12') to engage over said internal recess (10) and retaining ring (5) into compressive contact with said rear projection (12') to transmit compressive forces to the rear projection (12') on insertion of the second pipe member (6) into the socket (2), said projections on said sealing ring upon insertion of said second pipe member into the socket forming in co-operation therewith, pressure shoulders positioned to act so as to compress the packing ring against the pipe member wall defining the groove over the whole outer peripheral portion of the sealing ring.

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POWER CHUCK

Karl Hiestand, Pfullendorf, Fed. Rep. of Germany, assignor to SMW Schneider & Weisshaupt GmbH, Fed. Rep. of Germany

Filed May 7, 1984, Ser. No. 607,620

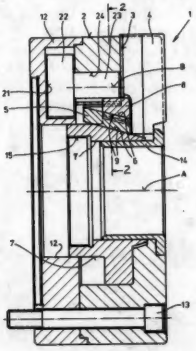
Claims priority, application Fed. Rep. of Germany, May 7, 1983, 3316770

Int. Cl.⁴ B23B *31/14*

U.S. Cl. 279—1 C **11 Claims**

1. A power operated chuck, comprising a rotatable chuck body having a longitudinal axis, a plurality of clamping jaws radially movably mounted to said chuck body, a piston axially movable on said chuck body parallel to said longitudinal axis, a jaw moving mechanism on said piston including first and second hook members each having a wedge-shaped surface which is inclined to the longitudinal axis and engaged with one of said jaws, said chuck body having a plurality of recesses, a counterweight movable in each of said recesses, a cover cover-

ing said chuck body and overlying said recesses, a pressure member alongside each of said counterweights laterally offset relative to a center of gravity of each of said counterweights and engaged therewith and mounted in said chuck body for rotary movement about an axis which is eccentric to said



center of gravity and which is parallel to the longitudinal axis in a manner such that the centrifugal forces produced by rotation of said chuck body move said counterweights radially and are applied against an exterior of said piston adjacent the wedge-shaped portions and against said hook members.

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CENTRIFUGAL CHUCKING APPARATUS

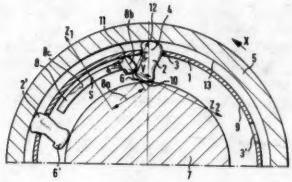
Fritz Feldmeier, and Gregor Hafner, both of Nuremberg, Fed. Rep. of Germany, assignors to Georg Muller Kugellager-Fabrik K.G., Fed. Rep. of Germany

Filed Nov. 3, 1978, Ser. No. 957,064

Claims priority, application Fed. Rep. of Germany, Nov. 3, 1977, 2749115

Int. Cl.⁴ B23B *31/14*

U.S. Cl. 279—1 C **10 Claims**



1. Chucking apparatus for fixing a member to be rotated to a rotatable driving member, comprising:

a cage member having at least one aperture formed therein and adapted to be mounted concentrically with respect to and for rotation with said driving member;

at least one clamping body freely movably mouted without pre-stressing within said aperture formed in said cage member, said clamping body having a first bearing surface adapted to engage the member to be rotated during rotation of said driving member and associated cage member; and

at least one lever member mounted for rotation with said driving and cage members, said lever member having a pair of end portions in engagement with said clamping body and said cage member respectively,

said lever member having a third portion which is urged outwardly with respect to the center of rotation of said driving member under the action of centrifugal force which, in turn, causes said lever member end portion which is in engagement with said clamping body to exert a force thereon having at least a component in the direction of the force which said clamping body exerts on the rotated member, said lever member positively bracing said clamping body in engagement with the rotated member.

4,572,526

DEVICE FOR CLAMPING TOOLS

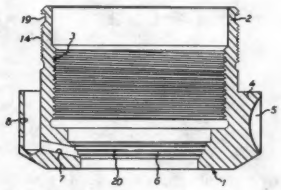
Lars E. Jönsson, Eslöv, Sweden, assignor to AB Lofab-Square, Malmo, Sweden

Filed Apr. 1, 1983, Ser. No. 481,408

Claims priority, application Sweden, Apr. 13, 1982, 8202293

Int. Cl.⁴ B23B *31/30*

U.S. Cl. 279—4 **8 Claims**



1. A device for clamping a tool to a holder, such as a shank-end mill, said device comprising an adjusting nut having a bore for receiving and actuating an adapter sleeve for mechanical clamping of the tool when said adjusting nut is mounted onto the holder, said adjusting nut (1) has at least one pressure medium chamber (7, 8) accommodating a piston (12) and opening into the bore where it is sealed by means of a membrane (9) adapted to rest against the adapter sleeve, and a complementary nut (13) mounted on said adjusting nut for displacing the piston within the chamber, thereby to effect pressure medium-controlled complementary clamping of the tool, said membrane being situated at and firmly attached to the end of said adjusting nut (1) facing away from the holder and being tilted towards and facing the holder to provide both axial and radial forces clamping the tool when said complementary nut effects said complementary clamping, said axial force component pressing the adapter sleeve and the tool towards the holder and said pressure medium applying a hydraulic clamping force to the tool where the tool exits said adjusting nut, thereby minimizing radial movement of the tool relative to said adjusting nut.

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APPARATUS FOR AUTOMATICALLY LEVELLING A BASE

Jonathan V. Stafford-Mills, The Old Vicarage, Tidenham, Near Chepstow, Gwent, and Nicholas R. Silcox, Severn House, East Horrington, Wells, Somerset, both of United Kingdom

Filed Apr. 11, 1984, Ser. No. 599,061

Claims priority, application United Kingdom, Apr. 11, 1983, 8309756

Int. Cl.⁴ B60S *9/00*; B62D *37/00*

U.S. Cl. 280—6.1 **4 Claims**

1. Apparatus for automatically levelling a base comprising:

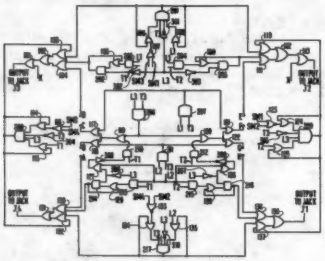
a first switch means for sensing mislignment in a first direction and for providing a first signal indicative of that misalignment;

a second switch means for sensing misalignment in a second direction and for providing a second signal indicative of that misalignment;

levelling means comprising a plurality of retractable and extendible height altering means for adjusting the disposition of the base with respect to a surface on which the base is to be levelled, each of which altering means is provided with a further switch which is activated in response to a contact between the levelling means and the

surface to provide a further signal indicative of that contact; and

control means responsive to said first, second, and further signals to control the levelling means and level the base (a), if the base is not level in both first and second directions, by controlling one only of the levelling means to level the base in one of the first and second directions and



then, by controlling another one or two adjacent levelling means to level the base in the other of the first and second directions; or (b), if the base is level in one of the said first and second directions but not level in the other of the said first and second directions, by controlling one or two adjacent levelling means to level the base in the other of the first and second directions.

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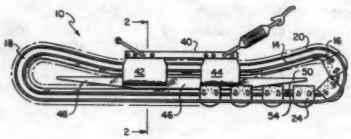
GRASS SKI

Curtis J. McBride, 1710 N. Cuyamaca St., El Cajon, Calif. 92020

Filed May 10, 1983, Ser. No. 493,285

Int. Cl.[4] A63C *17/10*

U.S. Cl. 280—11.1 ET **9 Claims**



1. A grass ski comprising:

an endless guide track constructed to resiliently flex under the weight of a skier to give the flexing characteristics of a snow ski;

a boot attachment mounted to said guide track for attachment to a boot;

an endless belt movably mounted on said guide track for traveling along said track; and

a cantilevered beam extending parallel to a portion of said guide track, said beam having a forward surface and a rearward surface which diverge away from said portion of said guide track and which are progressively engaged by said portion of said guide track as a pair of opposite ends of said guide track flex toward said boot attachment.

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ROLLER SKATE

Perry W. Thomas, 12708 12th St., Grandview, Mo. 64030

Continuation of Ser. No. 445,004, Nov. 29, 1982, abandoned. This application Jan. 25, 1985, Ser. No. 694,786

Int. Cl.[4] A63C *17/24, 17/04*

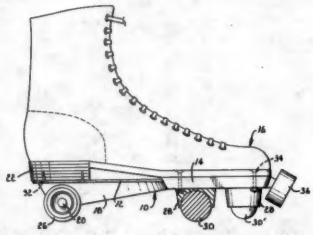
U.S. Cl. 280—11.1 BR **8 Claims**

1. A roller skate for a skater's shoe, said skate comprising:

an elongated, rigid frame adapted to be secured in supporting relationship beneath the shoe sole;

a first support roller device secured to the frame and projecting downwardly therefrom in disposition to engage a skating surface, said first device including an axle secured to the frame and extending transversely thereof, and a wheel journalled on the axle for only fore and aft rolling motion with respect to the frame;

a second support roller device secured to the frame in longitudinally spaced apart relationship forwardly along the frame from said first device, said second device including a socket member secured to the frame, there being a semi-spherical cavity in the socket member, and a sphere com-



plementally received in the cavity for rolling movement in any direction, said sphere projecting from the cavity and downwardly from the frame in disposition to engage said skating surface and;

a third roller device secured to the frame and projecting downwardly therefrom in disposition to engage the skating surface, said third device including a socket structure secured to the frame and spaced forwardly of said second member, there being a semi-circular cavity in the socket structure, and a sphere complementally received in the cavity for rolling movement in any direction, the sphere of said third device projecting downwardly from the frame a shorter distance than the projection of the sphere of said second device.

4,572,530

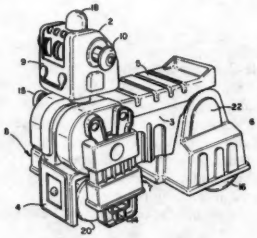
RIDE-ON CONVERTIBLE ROBOT

Joseph A. Marino, S. Ryland Rd., P.O. Box 306, Whitehouse, N.J. 08888

Filed Mar. 15, 1985, Ser. No. 712,568

Int. Cl.[4] A63G *19/00*

U.S. Cl. 280—1.185 **15 Claims**



1. A ride-on convertible robot comprising a body, a base below said body, a base wheel assembly on said base, an integrally moveable head, neck, front portion, and arm wheels, said robot having a selectable upright configuration and a rideable configuration, said arm wheels being concealed within said body when said robot is in said upright configuration and said said arm wheels and said base wheel assembly comprising

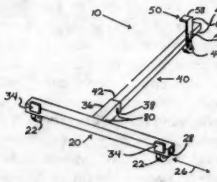
forward and rear floor-contacting wheels when said robot is in said rideable configuration.

4,572,531

SNOW PLOW DOLLY

Thomas L. Elia, 2915 Scott Ave., McHenry, Ill. 60050

Filed Jun. 15, 1984, Ser. No. 621,172
Int. Cl.[4] B62B *5/00*
U.S. Cl. 280—62 **20 Claims**



5. A dolly having a T-shape and being capable of receiving a snow plow assembly, said snow plow assembly including a snow plow blade and a snow plow mounting assembly to be held in position for easy mounting and removal from a vehicle, and further including a base piece secured to a cross piece to form said T-shape having wheels at each end of said cross piece and a castor on said base piece, said castor being oppositely disposed from said cross piece, wherein:

a. a base receiver is secured to an inner side of said cross piece at a central portion thereof in substantially perpendicular relationship therewith, said base receiver having a cross-sectional shape similar to said base piece;

b. said cross piece receives said base piece at a central portion of said cross piece;

c. a securing means for removably joining said base piece to said cross piece;

d. a plow rest for said snow plow blade is secured to said cross piece; and

e. an adjustable mounting support for said snow plow mounting assembly is secured to said base and oppositely disposed from said cross piece.

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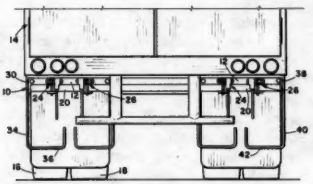
MUD FLAP HOLDER FOR TRUCKS

William C. Early, and Betty J. Early, both of 236 S. 184 E. Ave., Tulsa, Okla. 74108

Filed Jul. 24, 1984, Ser. No. 633,966
Int. Cl.[4] B62D *25/18*
U.S. Cl. 280—154.5 R **3 Claims**



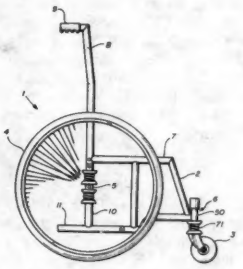
1. A mud flap holder comprising first bar means adapted to be secured to a vehicle in the proximity of a tire to be serviced by the mud flap, second bar means movably secured to the first bar for movement in directions toward and away from the first bar for clamping the mud flap therebetween and releasing the mud flap from engagement with the holder, clamping means operably secured between the first and second bar means for providing said movement for the second bar means with respect to the first bar means wherein the clamping means comprises spring urged means secured between the first and second bar means for constantly urging the second bar means in a direction toward the first bar means in a first position of the spring means and freeing the second bar means for movement in a direction away from the first bar means in a second position of the spring means, a first stop means provided on the clamping means for retaining the spring means in the first position thereof, a second stop means provided on the clamping means for limiting the movement of the spring means in the second position thereof, and arm means secured to at least one of the bar means and extending outwardly therefrom for limiting the movement of the clamped mud flap in a direction away from the tire during movement of the vehicle.

4,572,533

WHEELCHAIR SHOCK ABSORBING APPARATUS

Laura Ellis, 230 A. W. Guadalupe, LaGrange, Tex. 78945; Joe M. Caram, 3106 Aberdeen, Houston, Tex. 77025; John R. Cantu, 502 McDougal, San Antonio, Tex. 78223; Troy W. Dudley, P.O. Box 6, Haslet, Tex. 76052, and Mitchell A. Callahan, 2215 Silver Holly La., Richardson, Tex. 75081

Filed May 29, 1984, Ser. No. 614,776
Int. Cl.[4] A61G *5/02*
U.S. Cl. 280—242 WC **16 Claims**



1. Shock absorbing apparatus for use on a wheelchair of the type having a frame mounted on a pair of front wheels and a pair or rear wheels wherein said shock absorbing apparatus comprises shock mounting means on each of at least one of said pair of wheels comprising:

a vertical tubular member forming a portion of said frame and having an elongated slot in the walls thereof;

a slide bar slidingly disposed within said tubular member;

wheel attachment means attached to said slide bar and projecting perpendicularly therefrom through said slot for attachment of one of said wheels thereto;

first spring assembly carried by said tubular member above said wheel attachment means to cushion upward shock on said wheel; and

second spring assembly carried by said tubular member below said wheel attachment means to cushion downward shock on said wheel;

each of said first and second spring assemblies comprising a helically wound spring surrounding a portion of said tubular member and the ends of which are confined between a pair of annular spring retainer members.

4,572,534

FRONT WHEEL SUSPENSION FOR MOTORCYCLES

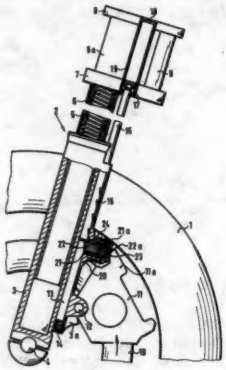
Gerrit Heyl, Munich, Fed. Rep. of Germany, assignor to Bayerische Motoren Werke Aktiengesellschaft, Fed. Rep. of Germany

Filed Oct. 6, 1983, Ser. No. 539,569

Claims priority, application Fed. Rep. of Germany, Oct. 9, 1982, 3237579

Int. Cl.[4] B62K *25/08*

U.S. Cl. 280—276 **21 Claims**



1. A front wheel suspension system for motorcycles having a front wheel fork with a fork bridge, the legs of said fork acting as telescopic shock absorbers consisting of a sliding tube member receiving an axle shaft of the front wheel and an upright pipe that can be immersed into the sliding tube against the force of a pressure spring, means being provided for the braking of the front wheel which, during the braking process, via a thrust rod, load an additional spring arranged at the fork bridge, wherein the thrust rod, during the braking process, is supported via a slideable bolt means, actuated in response to the braking means.

4,572,535

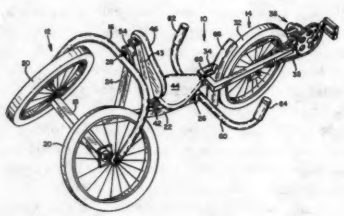
TRI-SUPPORTED VEHICLE

Brian C. Stewart, and Michael S. Lofgren, both of 20589 SW. Elk Horn Ct., Tualatin, Oreg. 97062

Filed Nov. 16, 1984, Ser. No. 671,964

Int. Cl.[4] B62K *5/04, 17/00*

U.S. Cl. 280—282 **16 Claims**



1. A tri-supported vehicle comprising; a first body member including a single steerable support member for supporting the first body member on the ground and adapted for controlling the direction of movement of the vehicle, a support bar supporting said steerable support member, and a seat for carrying a rider supported by said support bar and rigidly interconnected through said support bar to the steerable support member whereby pivotal movement of the seat effects similar pivotal movement of the steerable support member, a second body member including a pair of spaced apart steerable support members for supporting the second body member on the ground, said pair of steerable support members locked together in spaced and parallel directed relationship, a support frame supporting said pair of support members, and a first pivotal connection on said support frame, and a second pivotal connection on said support frame located rearwardly and upwardly relative to the first pivotal connection, said first and second pivotal connections establishing between them a pivotal axis, said first and second pivotal connections connecting the second body member to the first body member whereby the first body member is pivotable relative to the second body member, said pivotal axis being angled so as to intersect the ground between the steerable support member and pair of support members and sufficiently rearward of the steerable support member to effect lateral buckling between the support bar and support frame while turning, and said pivotal connections permitting pivotal swinging of the seat about the pivotal axis so as to effect side and rearward tilting of the single steerable support member for stabilized maneuvering of the vehicle.

4,572,536

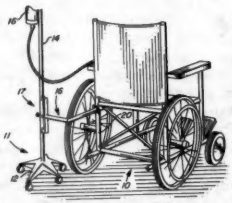
I V POLE INTERCONNECTION COUPLING

Val J. Doughty, 512 E. Riviera Dr., Tempe, Ariz. 85282

Filed May 26, 1983, Ser. No. 498,324

Int. Cl.[4] A47C *7/62*

U.S. Cl. 280—289 WC **9 Claims**



4. A coupling for interconnecting a wheel intravenous feeding bottle support stand with a wheeled patient-carrying apparatus including in combination:

a first hollow tubular member for rigid attachment to a wheeled patient-carrying apparatus, said first tubular member having an axial slot formed through the wall of said first member for a portion of the length thereof, with at least one offset circumferential slot joining said axial slot; and

a second tubular member having clamp means attached to one end thereof, said clamp means being adapted for removable attachment to the pole of a wheeled intravenous feeding bottle support stand, said second tubular member being inserted into said first tubular member and said second tubular member having a radially extending slot engagement pin thereon for extending into the slot in said first tubular member when said second tubular member is inserted into said first tubular member;

wherein said pin on said second tubular member engages said slot in said first tubular member for controlling and limiting the axial and rotational movement of said second tubular member within said first tubular member to define a first stored position of said second member adjacent the patient-carrying apparatus and for defining a second use position of said second tubular member spaced at least in part away from said patient-carrying apparatus for connection of said clamp means with the pole of such wheeled intravenous feeding bottle support stand so that such stand is coupled for movement with such wheeled patient-carrying apparatus.

4,572,537

COUPLER FOR CONNECTING TRAILER TO TRACTOR

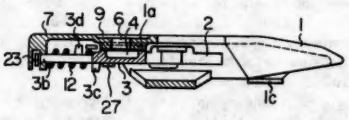
Takashi Hattori, Fukuoka, and Tadao Otsuka, Nishinomiya, both of Japan, assignors to Hitachi Metals, Ltd., Japan

Filed Sep. 20, 1984, Ser. No. 652,655

Claims priority, application Japan, Sep. 21, 1983, 58-145103[U]

Int. Cl.[4] B62D *53/08*

U.S. Cl. 280—433 2 Claims



1. A coupler for connecting a trailer to a tractor comprising:

a main plate including a top surface and a bottom surface and having an oil groove formed on the top surface to allow a lubricant to flow therethrough;

a pair of king pin locking jaws secured to the bottom surface of the main plate for pivotal movement in a horizontal plane to cooperate with each other to releasably hold a king pin therebetween; and

a locking member located on the bottom surface of the main plate for sliding movement in which it is brought into and out of engagement with the jaws, to be inserted in a space defined by heads of the jaws when the king pin is held between the jaws to keep the jaws from pivotally moving;

the locking member including an oil sump located on a top surface thereof, and an oil passage extending from the oil sump to an outer periphery of the locking member, while the main plate including a trough hole extending through the main plate from a position in which it communicates with the oil groove on the top surface of the main plate to the oil sump on the top surface of the locking member.

4,572,538

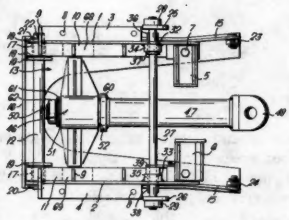
TRAILER COUPLING DEVICE

Charles P. Schofield, Greenfield, and Arthur L. Wilkin, Hitchin, both of England, assignors to National Research Development Corporation, London, England

Filed Jun. 6, 1984, Ser. No. 617,732

Int. Cl.[4] B60D *1/00*

U.S. Cl. 280—478 R 15 Claims



1. A coupling device comprising:

a main frame adapted for attachment to the underside of a vehicle,

a detachable coupling member having complementary portions,

a guideway attached to said main frame and adapted to move downwardly relative to said main frame when said main frame is in position under said vehicle, said guideway being adpated to receive and guide along its length from its rearward end, most distant from said vehicle, to its forward end, said detachable coupling member, and

a latching means for positively holding said detachable coupling member to said main frame at said guideway's forward end, wherein said latching means includes defining at least one recess between said guideway and said main frame and adapted to receive at least one said complementary portion of said detachable coupling member, so that when said guideway is moved downwardly relative to said main frame, said complementary portion can enter a recess, but when said guideway is moved to upwardly relative to said main frame, the recesses closes to an extent at least sufficient to prevent the escape of said complementary portions therefrom.

4,572,539

SAFETY BINDING FOR A SKI

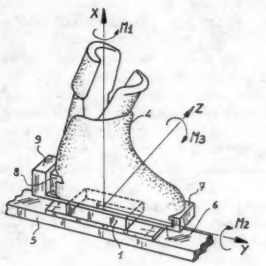
George P. J. Salomon, Annecy, France, assignor to Salomon S.A., Annecy, France

Continuation of Ser. No. 210,388, Nov. 17, 1980, Pat. No. 4,383,702, which is a continuation of Ser. No. 863,146, Dec. 27, 1977, abandoned. This application Sep. 14, 1982, Ser. No. 418,182

The portion of the term of this patent subsequent to May 17, 2000, has been disclaimed.

Int. Cl.[4] A63C *9/08*

U.S. Cl. 280—611 60 Claims



1. A device for detecting the lateral and vertical stresses to which a skier's leg is subjected on a ski, comprising:

(a) a test member connecting a ski boot to a ski and supporting said boot;

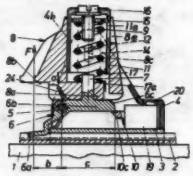
(b) a lateral stress detection means on said test member for detecting stresses biasing said leg along at least one of the following directions: around a vertical axis and along a horizontal axis perpendicular to the longitudinal axis of said ski; and

(c) a vertical stress detection means on said test member for detecting vertical stresses, wherein said ski and boot further comprise two spaced apart elements supporting said boot on said ski and between which said test member is positioned, and wherein one of said elements is adapted to permit release said boot in response to detected stress, wherein said test member has a first pair of vertical walls wherein said lateral stress detection means comprises a first set of four gauges, including a first pair and a second pair on opposite vertical walls of said member from each other, and on either side of the longitudinal plane of symmetry of said ski, wherein said first set of four gauges are disposed at an acute angle with respect to a vertical and transverse plane of symmetry.

4,572,540
SAFETY SKI BINDING

Edith Vinazzer, Vienna, and Johann Sollak, Baden, both of Austria, assignors to TMC Corporation, Baar, Switzerland

Filed Dec. 21, 1982, Ser. No. 451,915
Claims priority, application Austria, Dec. 23, 1981, 5526/81
Int. Cl.[4] A63C 9/08
U.S. Cl. 280—612 **12 Claims**

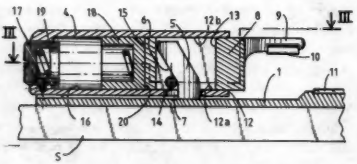


1. In a safety ski binding, including a bearing block which can be secured against movement with respect to a ski and a sole holder which is pivotal together with a stepping member about a swivel axle provided on the bearing block, the swivel axle extending transversely with respect to the longitudinal direction of the ski, wherein the sole holder can be releasably held by means of a lock mechanism in a downhill skiing position, the lock mechanism being operable by an electromechanical actuating device which is provided in a circuit and the lock mechanism releasing the sole holder upon an overload to permit it to swing into an open position, the improvement comprising means supporting the sole holder for movement against the force of a spring in a vertical direction relative to the stepping member, switch means for closing the circuit after a predetermined amount of upward movement of the sole holder relative to the stepping member, and means for supporting an abutment on the bearing block in a manner permitting the abutment to be adjusted vertically relative to the bearing block, the spring being supported at a first end on the sole holder and at a second end on the adjustable abutment, wherein the lock mechanism includes a lock member movable between a locking position and a retracted position by the electromechanical actuating device, and wherein the lock mechanism includes means for releasably holding the stepping member in the downhill skiing position when the lock member is in its locking position and for permitting pivotal movement of the stepping member to a release position when the lock member is moved to its retracted position.

4,572,541
SAFETY TOE-ABUTMENT MEMBER FOR A SKI

Jean Bernard; Jean Beyl, both of Nevers; Daniel le Faou, Varennes Vauzelles; Henri Peyre, and Patrice Viodet, both of Nevers, all of France, assignors to Ste LOOK, Nevers, France

Filed Aug. 1, 1983, Ser. No. 518,938
Claims priority, application France, Aug. 3, 1982, 82 13510
Int. Cl.[4] A63C 9/08
U.S. Cl. 280—628 **10 Claims**



1. A safety toe abutment member for a ski, wherein said member comprises:

a base plate which is intended to be fixed on the top face of the ski and is adapted to carry an upstanding locking member provided with locking means directed towards the front tip of the ski;

a body mounted on the base plate for pivotal displacement about a transverse axis;

a jaw unit for retaining the toe end of the ski boot, said jaw unit being guided within a housing of the body for rotational displacement and translational displacement in the forward direction;

two bearing elements rigidly fixed to the jaw unit, one element being directed towards the tip of the ski and the other element being directed towards the heel of the ski;

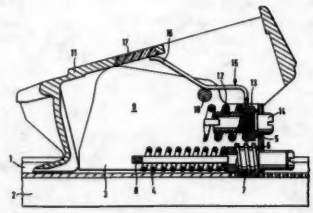
a piston capable of displacement within the body in a direction parallel to the longitudinal axis of the ski;

a resilient member housed within the body and so arranged as to exert on the piston a force which is directed towards the heel of the ski in order to ensure that the rear face of said piston is resiliently applied against said first bearing element and in order to ensure that the second bearing element is resiliently applied against the locking means.

4,572,542
INDICATOR FOR SAFETY SKI BINDING

Walter Knabel, Murnau, and Gerd Klubitschko, Oberau, both of Fed. Rep. of Germany, assignors to Marker International, Salt Lake City, Utah

Filed Dec. 28, 1982, Ser. No. 453,919
Claims priority, application Fed. Rep. of Germany, Dec. 29, 1981, 3151767
Int. Cl.[4] A63C 9/08
U.S. Cl. 280—634 **14 Claims**



1. An indicator in a safety ski binding, said binding including at least one grasping piece having latching and releasing positions for latching and releasing a portion of a ski boot, respectively, said grasping piece comprising:

a stationary part fixable to a ski and including adjusting means for adjusting an operating characteristic of the grasping piece;

a pivoting part pivotally connected to said stationary part along a transverse axle for engaging a ski boot;

window means in said pivoting part for viewing an indicator means; and

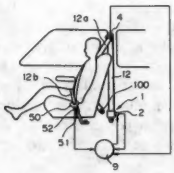
indicator means for indicating the setting of said adjusting means including first and second ends, said first end being connected to said adjusting means for movement in response to adjustment of said adjusting means, said axle supporting said indicator means intermediate said first and seconds ends, and said second end bearing on said window means.

4,572,543

RETRACTABLE SAFETY BELT SYSTEM

Noboru Tsuge, Kariya; Satosi Kuwakado; Masahiro Taguchi, both of Aichi, and Toshio Yasui, Anjo, all of Japan, assignors to Nippon Soken, Inc., Nishio and Nippondenso Co., Ltd., Kariya, both of, Japan

Filed Jun. 7, 1984, Ser. No. 618,351
Claims priority, application Japan, Jun. 8, 1983, 58-102243
Int. Cl.[4] A62B *35/00*
U.S. Cl. 280—807 15 Claims



9. A three-point type retractable safety belt system for restraining a vehicle occupant in a seat of a vehicle having a vehicle body and a door, which comprises:

a seat belt having first and second ends, said first end being firmly secured to said vehicle body generally at one side of the seat adjacent said door and generally at the level of said seat;

a retractor secured to said vehicle body generally at said one side of and at the level of said seat, said retractor including a body, a reel mounted rotatably on said body and engaging with said second end of the seat belt for protraction and retraction, latch means for preventing rotation of said reel, activator means for rendering said latch means selectively operable, and an electric motor means for rotating said reel in the belt winding direction;

a slip joint mounted swingably to said vehicle body generally at said one side of and at the rear of the seat and at a level substantially higher than the level of the seat;

a buckle secured to said vehicle body at the other side of the seat;

a tongue plate releasably engageable with said buckle;

said seat belt being passed through said slip joint and said tongue plate to define a lap belt section between said first end of the seat belt and said tongue plate and a shoulder belt section between said tongue plate and said slip joint; and,

control means including a drive circuit for selectively energizing said electric motor means of said retractor;

said control means including means for detecting the protraction rotation of said electric motor means and for activating said drive circuit under the protraction rotation condition of the electric motor means to energize said electric motor means causing said reel to be rotated in the winding direction to retract the seat belt.

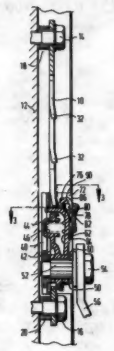
4,572,544

ANCHORAGE MEANS FOR VEHICLE SAFETY BELTS

Douglas J. Cunningham, Lutterworth; Robert F. Else, Locks Heath, and David A. Harries, Rustington, all of England, assignors to Britax (Wingard) Limited, England

Filed May 1, 1984, Ser. No. 605,774
Claims priority, application United Kingdom, May 11, 1983, 8313023
Int. Cl.[4] B60R *22/00*
U.S. Cl. 280—808 9 Claims

1. An adjustable pillar loop assembly comprising a vertically extending track mounted on the interior of a vehicle body above the level of the shoulders of an occupant of an adjacent seat, a traveller mounted on the track, a guide member secured to the traveller and having a slot for receiving the strap of a safety belt, a latch member having a latching formation thereon, resilient means for biasing the latching formation into engagement with one of a series of complementary formations on the track so as to inhibit movement of the traveller along the track, blocking means for preventing movement of the



latching formation out of engagement with the complementary formations and manual release means operative first to inhibit the blocking means and then to disengage the latching formation from the complementary formations.

4,572,545

SKI-POLE HAND SHIELD

John C. Dooley, Jr., 27 Curtis Pl., and Richard Pikulski, 139 Beechwood Ave., both of Staten Island, N.Y. 10301

Filed Jun. 17, 1983, Ser. No. 505,212
Int. Cl.[4] A63C *11/22*
U.S. Cl. 280—821 14 Claims

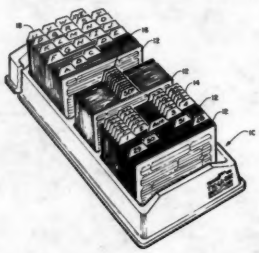
1. For use with a ski pole having an axis-defining shaft terminating at an upper end in a grip; a hand shield comprising:

a main body having a mounting part including an arced gripping portion at its lower end which is generally centered on the axis and securable around the ski pole adjacent and below the grip thereof, and an axially upwardly open U-section guard flaring upward and radially outward from the mounting part, the guard surrounding the grip at a spacing sufficient for a hand to engage around the grip within the guard; said guard being formed with a pair of angularly offset and inwardly open recesses positioned to receive the thumb tip of a respective hand engaged around the respective grip; said mounting part being generally tubular and including a U-section main piece and a separate minor piece fittable therewith, fasteners engaging through the pieces to clamp same to the shaft of the said ski pole.

4,572,546
BOOKPIN
Joseph A. Morrison, 8070 Craig St., Philadelphia, Pa. 19136
Filed Oct. 26, 1983, Ser. No. 545,441
Int. Cl.[4] B42D *9/00*
U.S. Cl. 281—42 3 Claims

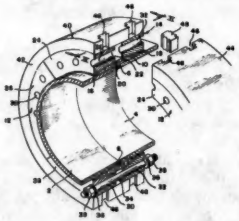
1. A bookpin for clamping onto an open book and holding the pages flat for reading, comprising
a front hold down arm having a predetermined length and having a free end and a hinge end,
a rear hold down arm having substantially the same length and having a free end and a hinge end,
and hinge means connecting the hinge ends to urge the front and rear arms together so as to clamp onto an open book and hold it flat for reading,
said front hold down arm being made of a clear see-through material so a reader can read through it,
said free ends forming an open end of the bookpin for slipping it over the book,
said hinge means forming a closed end of the bookpin, said bookpin having a one-piece construction.

4,572,547
MULTI-FUNCTION TICKLER FILING SYSTEM
Geoff Phillips, 7248 Arpege Rd., San Diego, Calif. 92119
Filed Oct. 24, 1983, Ser. No. 544,631
Int. Cl.[4] B42F *21/00, 17/00;* G09D *3/00*
U.S. Cl. 283—36 8 Claims



1. A perpetual method of keeping track of a plurality of different dates for separate future events comprising a container, having a front and back, a plurality of future event information file cards each indicating a past, current or future event of a specific subject matter, and the date thereof, daily divider cards numbered one through thirty-one corresponding to the date of the days of the month and monthly divider cards each identified with a month of the year, said method comprising:
(a) positioning the monthly divider cards in the container sequentially from the current month to the last month of the year, said monthly divider cards of past months of the year are positioned sequentially behind the last month of the year monthly divider cards,
(b) positioning in the container in front of the monthly divider cards sequentially from front to back the daily divider card representing the day following the current day to the thirty-first day, said daily divider cards representing the current and past days of the current month are positioned sequentially behind the current monthly divider card,
(c) placing said future event information file cards having an event with a future date falling after the current date within the current month in front of the daily divider card indicating the date on which that future event falls,
(d) placing said future event information file cards which have a future event falling on a date after the month following the current month in front of the monthly divider card for the month in which the future event occurs,
(e) placing said future event information file cards having an event date falling within the month following the current month sequentially in front of the daily divider cards indicating the day of the month of that future event prior to the last day of the current month, and,
(f) moving the current month of the year card from the front of the container to a position behind the last positioned month of the year card on the last day of the current month.

4,572,548
PIPELOCK
Jan S. Porowski, Pittsburgh, and William J. O'Donnell, Bethel Park, both of Pa., assignors to O'Donnell & Associates, Inc., Pittsburgh, Pa.
Filed Oct. 4, 1983, Ser. No. 539,074
Int. Cl.[4] F16L *21/06*
U.S. Cl. 285—15 5 Claims



1. A novel pipelock adapted to surround and to grip a pair of pipe ends joined by a weldment to produce axial and circumferential compressive stresses at the weld location and thereby reduce crack growth rates comprising a first pair of rings facing each other axially, with the inner diameter of each ring at the outer face being smaller than the inner diameter of each ring at the inner face, each of said first pair of rings comprising at least two circumferential parts, means to restrain movement of facing circumferential parts outwardly from each other, at least one second ring comprised of at least two circumferential parts connected to each other at each adjoining face by at least two keys to secure said latter circumferential parts together to prevent circumferential and out-out-plane relative movement of said latter circumferential parts, outwardly surrounding said first pair of rings, and constraining outward radial movement of said first pairs of rings and at least one ring, comprised of at least two circumferential parts, having an outer surface conforming substantially to the inner surface of said first pair of rings and an inner surface conforming substantially to the outer surface of a pipe adapted to fit therethrough.

4,572,549
SUBSEA PIPELINES

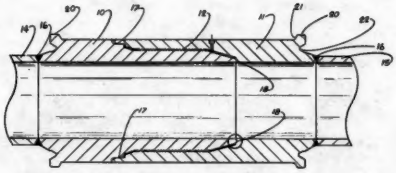
Derek Sidwell, Arlington, Tex., assignor to Cameron Iron Works, Inc., Houston, Tex.

Filed Aug. 23, 1983, Ser. No. 525,637

Claims priority, application United Kingdom, Aug. 24, 1982, 8224231; Oct. 4, 1982, 8228307; Nov. 2, 1982, 8231343

Int. Cl.⁴ F16L *55/00*

U.S. Cl. 285—39 **4 Claims**



1. A connector for connecting pipeline sections comprising,

a tubular member having interconnectible male and female portions,

one portion in use being joined to an end of one pipeline section and the other portion being joined to the adjacent end of another pipeline section which is to be connected to the one section,

each of the connector portions having an external profile to define a means of attachment for a collet type connector including a surface to receive collet fingers and a surface to receive a seal ring whereby when the two portions are connected and then severed from the pipeline section at one end a collet connector may be used to reconnect to the severed end.

4,572,550
MOVABLE CARRIER FOR SUPPLY LINES PLACED ALONG A TELESCOPING AIRPLANE PASSENGER BRIDGE

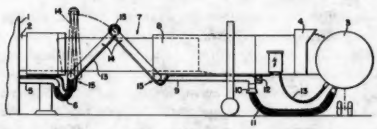
Helmut Harder, Kassel, Fed. Rep. of Germany, assignor to Thyssen Industrie Aktiengesellschaft, Essen, Fed. Rep. of Germany

Filed Nov. 17, 1983, Ser. No. 552,507

Claims priority, application Fed. Rep. of Germany, Jul. 2, 1983, 8319159[U]

Int. Cl.⁴ F16L *59/16*

U.S. Cl. 285—47 **1 Claim**



1. A movable carrier for fixed supply lines which are placed and clamped in predetermined positioning along a telescoping airplane passenger bridge, and which establish communication between connectors at the airport terminal and corresponding connectors on an aircraft; said carrier comprising:

a supply line system, the length of which cannot vary, and which includes a plurality of linear conduits and swivel joints which are respectively interposed at those ends of said conduits which face one antoher; at least two adjacent ones of said conduits being vertically, angularly movable, as well as having one end of each thereof held in position relative to said passenger bridge; each conduit, along sections thereof, being provided with two-piece support brackets which are embodied as clamps and are provided with holding means for receiving further supply lines which are disposed around that conduit;

each of said swivel joints, which serve as conduit connectors, comprising two conduit bends which are supported in such a way as to be rotatable about longitudinal axes thereof, and which are connected to one another in a pressure-tight manner; both of said conduit bends being approximately the same length, and one of them being provided with a central recess for receiving the other one therein; a pivot bearing in the form of a roller bearing being disposed between said conduit bends to permit said rotation thereof; a support member being provided for axially securing said two conduit bends, which are rotatably disposed within one another, relative to one another; said conduit bend being provided with said recess having an end face, to which said support member is detachably connected; and

molded parts which are made of insulating material and surround each of said conduits, respectively, and each of said swivel joints, respectively; said conduits and said swivel joints with the carrier itself serving for supply function; said conduits being connected via said swivel joints only at ends thereof toward each other as well as an axis of each swivel joint being located in the zenith of conduit axes, each swivel joint also having a constant-opening cross section over entire length thereof complementary to said conduits.

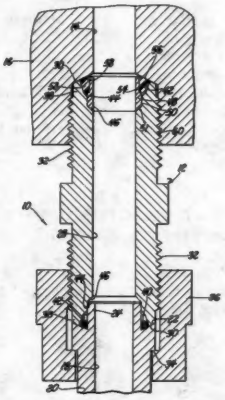
4,572,551
FLUID CONNECTOR

Robert D. Jaquette, Charlotte, Mich., assignor to Air-Way Manufacturing Company, Olivet, Mich.

Filed Jul. 6, 1983, Ser. No. 511,287

Int. Cl.⁴ F16L *33/16*

U.S. Cl. 285—108 **10 Claims**



1. A connector assembly (10) comprising: a first member (16,20) including a first fluid passageway (14,18) therethrough and a female end portion having a conical surface (22,58); a second member (12) including a second passageway (28) therethrough in fluid communication with said first passageway (14,18) and a male end portion having a conical surface (30) in mating engagement with said conical surface (22,58) of said female end portion; and connecting means for axially urging said conical surfaces (22,30,58) into mating engagement and characterized by said second passageway (28) within said male end portion having an increased diameter defining a recessed wall (38) thereabout being outwardly radially deflectable in response to internal fluid pressure applied against said recessed wall (38) to perfect a seal between said conical surfaces

(22,30,58), said mating conical surfaces (22,30,58) defining a parting line having an inner end, said assembly (10) including sealing means (40,52) disposed within said recessed wall (38) and about said inner end of said parting line for further perfecting a seal at said parting line when the internal pressure is initially applied thereto.

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CLIP FOR PIPES, HOSES AND THE LIKE

Sune A. W. Örevik, Huddinge, and Torsten R. Grönberg, Nacka, both of Sweden, assignors to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden

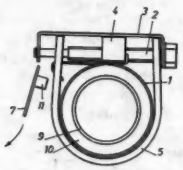
PCT No. PCT/SE84/00080, § 371 Date Nov. 30, 1984, § 102(e) Date Nov. 30, 1984, PCT Pub. No. WO84/03927, PCT Pub. Date Oct. 11, 1984

PCT Filed Mar. 6, 1984, Ser. No. 676,662

Claims priority, application Sweden, Mar. 31, 1983, 8301838

Int. Cl.[4] F16L *33/00*

U.S. Cl. 285—253 6 Claims



1. A clip for sealingly connecting to a nipple, a pipe composed of a material having capacity for cold flow, said clip comprising a constriction band encircling the pipe and nipple to be connected, said band having overlapping ends adapted for displacement in relation to each other, a nut rigidly attached to one end of the band, a threaded spindle supporting said nut for travel thereon upon rotation of the spindle for displacing said one end of the band relative to the other, and a resilient U-shaped element accommodating the band and including legs straddling the band, the other end of the band being secured to one leg of said U-shaped element, said threaded spindle being mounted for rotation in the other leg of said U-shaped element and disposed substantially in the central plane of the band.

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FLANGE CONNECTOR

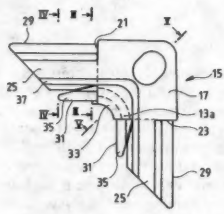
Siegfried Geldner, Inntalstr. 3, D-8201 Reischenhart, Fed. Rep. of Germany

Filed Dec. 27, 1984, Ser. No. 686,685

Claims priority, application European Pat. Off., Dec. 30, 1983, 83113251.9

Int. Cl.[4] F16L *23/00*

U.S. Cl. 285—363 9 Claims



1. Apparatus for joining adjacent sections of forced air heating ducts having generally rectangular profiles in cross-section, comprising:

(a) a plurality of angle bar members arranged to be mounted on the apposed end edges of said adjacent ducts to be joined, each said angle bar member having first and second mutually perpendicular flange segments, said flange segments being provided with a generally semicircular, inwardly-projecting, indentation extending along the imaginary line of intersection of the planes in which said first and second flange segments lie and each said first and second flange segments having its outer longitudinal edge formed into an arcuate, inwardly-turned curve;

(b) a plurality of molded corner pieces, each having a block portion having first and second generally planar major surfaces with an "L"-shaped recess formed in one corner of said first major surface thereof for receiving a corner edge of said forced air heating ducts and a pair of pluggable members projecting laterally outwardly from adjacent side edges of said block portion, said pluggable members being grooved for fitting within said arcuate, inwardly-turned curve of said first and second flanges and an arcuate groove formed in the second major surface of said block member, which when secured to the flanges of said angle bar members by said pair of pluggable members, forms a continuation of said generally semicircular inwardly projecting indentation.

4,572,554

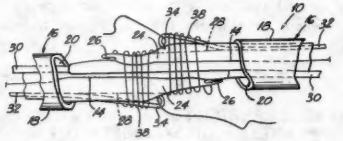
KNOT TYING TOOL

Owen R. Janssen, and George Spector, both of 233 Broadway, RM 3615, New York, N.Y. 10007

Filed Jan. 23, 1985, Ser. No. 694,123

Int. Cl.[4] D03J *3/00*

U.S. Cl. 289—17 4 Claims



1. A knot tying device for forming a barrel knot from two fishing line segments, said device consisting of two identical tools used in symmetrical juxtaposition, each said tool comprising:

(a) a hollow sleeve having open ends;

(b) a holder having a slot and a guiding track, said holder affixed and extending outwardly from one of said open ends of said sleeve so that said slot engages one of said fishing line segments that extends through said sleeve with said fishing line segment wrapped around said holder a plurality of times forming coils thereon;

(c) a prong affixed at one end to said holder and extending outwardly engaging another sleeve of another tool; and

(d) a hooked member having a hook at one end and a grasping handle at other end, said hooked member positioned within said guiding track of said holder with said hook engaging free end of said fishing line segment so that pulling of said grasping handle makes free end of said fishing line segment go through said coils forming said barrel knot.

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DEVICE USED FOR THE TYING OF A PROPER BOWLINE KNOT

Joseph R. Henderson, Jr., 9 Wilde Rd., Newton, Mass. 02168

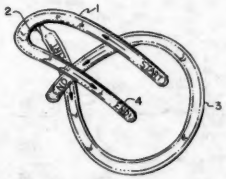
Filed Mar. 11, 1985, Ser. No. 710,476

Int. Cl.[4] B65H *69/04*

U.S. Cl. 289—17 1 Claim

1. A knot-tying guide comprising a length of a supportive material, whose upper surface has been adapted to stabilize and hold a section or cordage, and which has been formed into the

shape of an open bight wherein said bight contains space between the upper surface of the inferior section and the lower surface of the superior section where the material transverses itself in forming the bight and is attached by a connecting means at one of its termini to a U-shaped length of a supporting material, whose upper surface has also been adapted to stabi-



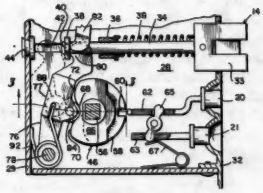
lize or hold a section of cordage, in such a manner that the termini of said U-shaped length lie within the vertical plane of said open bight and in which manner the two lengths, together, provide a form of a knot for the cordage, and wherein both lengths of supportive material are marked, by an indicating means as to starting point, direction and/or end point for inserting the cordage.

4,572,556

MORTISE LOCK

William R. Foshee, Indianapolis, Ind., assignor to Best Lock Corporation, Indianapolis, Ind.

Filed Oct. 24, 1983, Ser. No. 544,630
Int. Cl.[4] E05C *1/12*
U.S. Cl. 292—165 **10 Claims**



1. A mortise lock comprising
a case having front and back side walls and an edge face,
a latch bolt including a tailpiece,
support means for slidably mounting the latch bolt between the side walls,
a knob hub having a cam flange,
means for rotatably mounting the knob hub in the case for operation by a handle or knob,
a retraction lever for retracting the latch bolt, the retraction lever comprising a nose portion in engagement with the tailpiece to define a tailpiece contact point, a pivot portion pivotally mounted on a pivot in the case, and a mid-portion intermediate the nose and pivot portions including spaced-apart side walls defining a yoke open toward the cam flange, and
cam follower means for riding on the cam flange during rotation of the hub so that the retraction lever is pivoted rearward about the pivot in the case to retract the tailpiece in response to rotation of the knob hub, the cam follower means including a roller and shaft means for rotatably supporting the roller in the yoke to engage the cam flange to define a hub contact point, the hub contact point changing position on the cam flange in response to rotation of the knob hub, the tailpiece and hub contact points cooperating to define an effective lever arm of substantially constant dimension therebetween irrespective of the direction of hub rotation.

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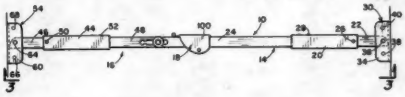
LOCKING DEVICE FOR SLIDING DOORS AND/OR WINDOWS

Raymond R. Taylor, 6816 E. 95th, Tulsa, Okla. 74133

Filed Mar. 13, 1984, Ser. No. 589,131
Int. Cl.[4] E05C *17/34*
U.S. Cl. 292—263 **3 Claims**



1. A locking device for a sliding door and/or window assembly and comprising:
a first and a second elongated tubular bar assembly, the bar assemblies being hingedly secured together in end-to-end relation, each bar assembly being formed of a tubular walled member and each having an inner end and an outer end, the bar assemblies being hinged to each other at the inner ends, the first bar assemblies having an elongated slot in the tubular wall, the longitudinal axis of the slot being parallel the bar member longitudinal axis, the slot being of selected width and having an intermediate portion and reduced width stop portions adjacent to and spaced from each end providing first and second slot locking portions;
pivotal end plate means secured to the outer end of each bar assembly for engagement with the doors and/or windows of the sliding doors and/or window assembly;
a slide member slideably received in said first tubular bar assembly and being moveable between a first position of internal engagement with both bar assemblies and a second position out of engagement with said second bar assembly to provide locking of the bar assemblies in an extended end-to-end relationship in the first position and unlocking of the bar assemblies for pivotal movement about the hinged connection therebetween in the second position;
spring bias means normally urging said bar assemblies out of end-to-end relationship;
a small diameter shaft secured to and extending radially from said slide member through said slot;
a knob member slideably received on said shaft, the knob member being dimensioned on its inner end to be slideably received in said slot and being postionable in said slot locking portions by outward pull thereon;
spring bias means normally urging said knob member inwardly towards said slide member, said slot being dimensioned so that said slide member can be moved between a locking and an unlocking position by said knob member in said slot intermediate portion and said slide member can be secured in a locked or an unlocked position by first outward pull on said knob member.

4,572,558

PLASTIC WHEEL OPENING MOLDING

Ronald Chupick, Warren, Mich., assignor to General Motors Corporation, Detroit, Mich.

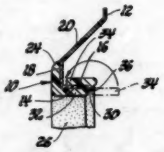
Filed Feb. 27, 1984, Ser. No. 584,008
Int. Cl.[4] B62D *25/16*
U.S. Cl. 293—128 **2 Claims**

1. A one-piece plastic wheel opening molding for attachment to an automotive fender having an exterior surface and a laterally inwardly and arcuately extending fender rim, said fender rim having an arcuately extending upper side and an arcuately extending underside defining the wheel opening,
said molding being shaped complementary with said wheel opening and having a cross section which is L-shaped to define first and second flanges in the as-molded condition,

said first flange being engageable with said fender along said exterior surface thereof adjacent said fender rim when said molding is being attached to said fender,

said second flange having a notch between its ends which extends throughout its arcuate extent to define a living hinge,

said hinge separating first and second aligned flange portions of said second flange,



said first flange portion engaging said underside of said fender rim when being attached to said fender,

said second flange portion, after stretching said living hinge, being foldable over against said upper side of said fender rim,

said second flange portion upon being folded over said upper side of said fender rim self-biasingly retaining itself in place to securely retain said molding in place on the fender.

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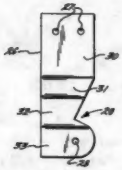
SCOOP FOR GATHERING LEAVES, GRASS, DEBRIS AND THE LIKE

John M. Gainey, Belle Chasse, La., assignor to Bobby C. Gainey, Belle Chasse, La., a part interest

Filed May 10, 1984, Ser. No. 608,976
Int. Cl.[4] B65B *67/12*; A01K *23/00*
U.S. Cl. 294—1.1 **8 Claims**



1. A scoop for gathering leaves, cut grass, or debris in disposable bags:

a. a walled scoop having an interior bore which communicates with two open end portions, the scoop having a generally flat lower surface extending substantially between the open end portions which is adapted to contact the ground as during the transfer of leaves, cut grass or debris into the scoop;

b. a scoop handle affixed to the upper surface of the scoop generally opposite the flat portion so that pressure can be applied to the handle to force the flat bottom against an underlying terrain;

c. a bracket positioned on the upper surface of the scoop adjacent the handle, and extending toward one of the open end portions of the scoop;

d. flexible strap having hooks on its end portions; and

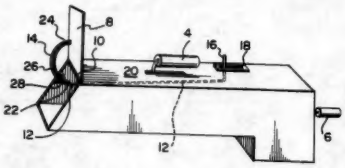
e. releasable connection means associated with the bracket for forming a connection with the bracket when the strap encircles the scoop so that the strap when connected to the bracket can secure a disposable bag to be filled to one end portion of the scoop.

4,572,560

ASH REMOVER

James Grandlouis, 1072 St. Jovite Ridge, Orleans, Ontario, Canada (K1C 1Y7)

Filed Feb. 15, 1985, Ser. No. 702,247
Claims priority, application Canada, Feb. 27, 1984, 448320
Int. Cl.[4] A47F *13/08*
U.S. Cl. 294—55 **9 Claims**



1. An ash remover comprising:

(a) a main body for carrying ashes,

(b) a cover secured to said main body and movable between an open and a closed position;

(c) a handle having one end connected to said cover,

(d) the other end of said handle terminating in a grip portion,

(e) said grip portion protruding through said body and being movable between a first position and a second position to cause said cover to correspondingly move between said open and closed positions,

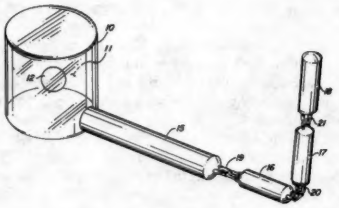
(f) wherein said handle is a rod-shaped member attached at one end remote from said grip portion to one end of a curved slotted member, the other end of the slotted member being attached to said cover, a guide member on said main body, in use the slot in said slotted member cooperating with said guide member to facilitate controlled movement of the cover, said curved member being a substantially arcuate member with the crown thereof towards the inside of the main body such that when said cover is in said open position said other end of the slotted member is substantially above said main body whereby the edge of said cover remote from its connection to said main body is also substantially above said body so as to provide a clear entrance to said main body to thereby facilitate the scooping of ash.

4,572,561

TOOL FOR MAGNETICALLY LOCATING AND RECOVERING ELECTRICAL WIRES

Thomas G. Hale, P.O. Box 892, Bonita Springs, Fla. 33923-0892

Filed Nov. 8, 1984, Ser. No. 669,599
Int. Cl.[4] E21C *29/16*
U.S. Cl. 294—65.5 **5 Claims**



1. A tool for locating and retrieving a magnetically attractive weight on the end of an electric wire suspended within a hollow wall comprising

a sealed transparent container of non-conductive material;

a clear liquid filling said transparent container;

a magnet immersed in said clear liquid, said magnet being

encased within a shell of buoyant material, the weight of said magnet and its buoyant shell being equal to the weight of an equal volume of the clear liquid;

a rod-like handle of non-conductive material having one end attached to the transparent container; and

a plurality of swivelably connected cylindrical magnets attached to the opposite end of said rod-like handle.

4,572,562

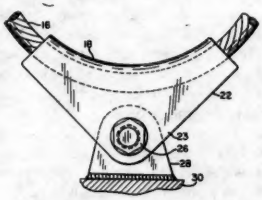
LIFTING SLING

Dennis J. Page, Kelso, Wash., assignor to P & H Logging Co., Inc., Kelso, Wash.

Filed Apr. 12, 1985, Ser. No. 722,539

Int. Cl.[4] B66C *1/18*

U.S. Cl. 294—74 **1 Claim**



1. A lifting sling arrangement for an object to be lifted, said lifting sling comprising a length of stiff wire rope and a coupling connecting the ends thereof together in coaxial relation to form a closed loop, an arcuate guide track containing a portion of the sling for sliding movements of the sling in the guide track, said guide track comprising a channel member having a pair of radially outstanding apertured ears on the side walls of said channel member, an upstanding apertured lug mounted on the top side of said object, and a horizontal bolt pivotally interconnecting said pair of ears and said lug, said pivot bolt allowing said sling loop to pivot down against said top side of the object when the sling is not being lifted and said ears holding said sling loop in a vertical plane above said object for convenient engagement by a crane hook or grapple.

4,572,563

HANGING DEVICE TO A TRANSPORT MEANS, WITH FACILITATED HOOKING AND AUTOMATIC RELEASE

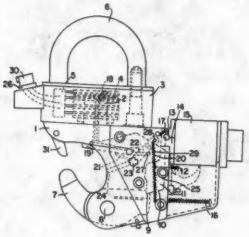
Ludovico Fontana, Bari, Italy, assignor to Tecnovar Italiana S.p.A., Bari, Italy

Filed Jan. 31, 1984, Ser. No. 575,539

Claims priority, application Italy, Feb. 4, 1983, 19433 A/83

Int. Cl.[4] B66C *1/36*; H07B *1/02*

U.S. Cl. 294—82.24 **6 Claims**



1. In a device for supporting a bracket that supports a load lifting sling, said device being of the type comprising an eyelet having an enlarged base with a central hole, a pin rotatably supported in said hole and extending downward into a first hook part, a second hook part pivoted on the first about a pin with horizontal axis positioned in the lower end of the first hook part, releasable locking means to retain said second hook part in an active position to form with the first part an essentially closed hook, and electrical connection means to transmit electric signals from the hook to said bracket; the improvement in which said electrical connection means comprise at least one contact rod oscillating between a rest position, in which it is housed in a seat formed in said enlarged base, and an active position, in which it bears on a respective contact surface provided on a said bracket, a lever controlling said oxcillating movement, said lever moving under the action of said bracket being carried into the hooking position, and pressure spring means associated with said lever to control the pressure with which said contact rod bears on a said contact surface.

4,572,564

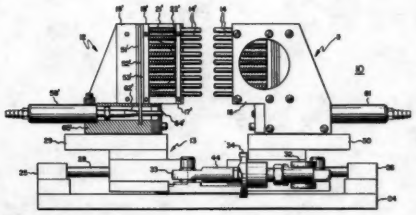
ADAPTIVE GRIPPING DEVICE

Thomas M. Cipolla, Ballston Lake, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Jul. 12, 1984, Ser. No. 630,152

Int. Cl.[4] B25J *15/00*

U.S. Cl. 294—88 **6 Claims**



1. An adaptive gripping device for industrial robots and fixturing parts comprising:

two substantially identical opposing jaw assemblies both having a matrix of axially movable gripper pins and means for biasing said pins to a fixed position;

an operating mechanism on which said jaw assemblies are mounted to have opposing linear relative motion to grasp and release an object, and means for activating said operating mechanism to slide said jaw assemblies together causing individual pins to contact the object and be depressed and collectively conform to the shape of the object;

each jaw assembly including pin locking means comprised of two locking mechanisms for each pin operating in opposite directions that mechanically lock the pin in any position within its range of motion when an axial force is applied to the pin, whereby said jaw assemblies retain the object shape after release of said object, and pin unlocking means actuated by power means for unlocking all of said pins which are returned by said biasing means to said fixed position.

4,572,565

STOPPER FOR A WIRE ROPE

Irving Epstein, Seattle, Wash., assignor to Washington Chain & Supply Company, Inc., Seattle, Wash.

Filed Aug. 9, 1984, Ser. No. 639,633

Int. Cl.[4] B66C *1/44*; F16G *11/04*

U.S. Cl. 294—102.1 **20 Claims**

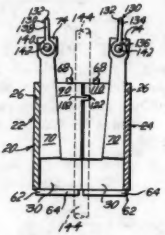
1. A stopper for rope, said stopper comprising:

a. a frame;

b. said frame comprising a first U-channel and a second U-channel;

c. said first U-channel comprising a base and a first leg and a second leg;

d. said second U-channel comprising a base and a first leg and a second leg;
e. a hinge means connecting with said first U-channel and with said second U-channel to allow said first U-channel and said second U-channel to rotate toward each other and to rotate away from each other;
f. in a closed position said legs of said first U-channel juxtapositioned to said legs of said second U-channel;
g. a jaw identified as a first jaw in said first U-channel and having a U-channel for contacting said rope;
h. a wedge identified as a first wedge in said first U-channel and positioned between said base and said first jaw;
i. a jaw identified as a second jaw in said second U-channel and having a U-channel for contacting said rope;



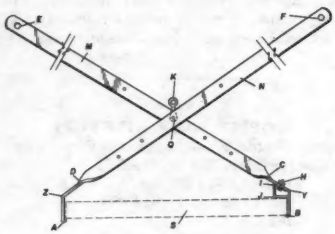
j. a wedge identified as a second wedge in said second U-channel and positioned between said base and said second jaw;
k. said first wedge has a head which is outside of said first U-channel and a body which increases in thickness upon moving away from said head;
l. said second wedge has a head which is outside of said second U-channel and a body which increases in thickness upon moving away from said head;
m. each head of each wedge having a means for receiving an object such as a shackle or a cable; and,
n. a locking means connecting with said first U-channel for definitely positioning said first U-channel and said second U-channel in a closed position for said first jaw and said second jaw to be juxtapositioned to said rope.

4,572,566

SLAB LIFTER

John C. Terrington, 23, Burnt St., Wells-Next-The-Sea, Norfolk, NR23 1HP, England

Filed Oct. 25, 1983, Ser. No. 545,256
Claims priority, application United Kingdom, Oct. 26, 1982, 8230533; May 5, 1983, 8312300
Int. Cl.[4] B25B 7/02
U.S. Cl. 294—118 **12 Claims**



1. A slab lifter which comprises a pair of bars, pivot means for coupling said bars one to another to permit said bars to rotate with respect to each other about a mutually perpendicular axis, each said bar having at one end a slab-gripping portion bent at an obtuse angle A of 100 to 140 degrees towards the position of said slab-gripping portion of the other bar so that said slab-gripping portion can be inserted between adjacent slabs and together with the other slab-gripping portion can grip opposite side edges of a slab of distance L apart, the distance from said axis of rotation to said slab-gripping portion of one of said bars being approximately equal to 0.5 L/sine (A), wherein,

said slab lifter further comprises stabilizer means adapted to contact a horizontal upper surface portion of said slab when said slab is gripped between said slab-gripping portions for stabilizing said slab when said slab is gripped by means of said slab gripping portions and lifted, said stabilizer means including a stabilizer member defining a substantially horizontal stabilizing surface and having one end rigidly fixed at a stabilizing position to said one of said bars such that said stabilizer member extends away from said one bar towards the other of said bars, said stabilizing surface thereby contacting said horizontal surface portion when said side edge, adjacent to said horizontal surface portion, is gripped by said gripping member associated with said one bar, and, wherein

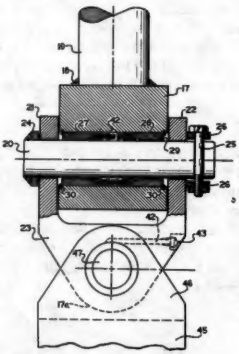
said bars extend on the other side of the axis of rotation and are of such length and shape that they project laterally at least as far as the vertical plane of the opposite edge of a gripped slab so as to provide handles.

4,572,567

SNUBBING APPARATUS FOR GRAPPLES AND THE LIKE

Thomas E. Johnson, Woodstock, Canada, assignor to Timberjack Inc., Woodstock, Canada

Filed Apr. 26, 1984, Ser. No. 604,243
Int. Cl.[4] B66C 1/00; F16F 7/06
U.S. Cl. 294—119.4 **9 Claims**



1. An apparatus for pivotably suspending a load including a snubber for controlling or dampening oscillation of the load comprising:

a pin and housing assembly, a bore in said housing through which said pin extends,

means for suspending a load from said pin,

bearing means positioned in said bore between said pin and bore forming a cavity between the bore of said housing and the pin,

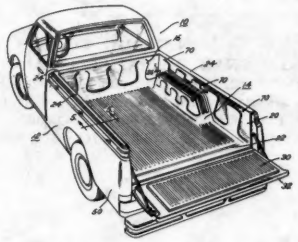
annular seal means in said cavity, means for pressurizing the cavity, and a snubber means positioned in said cavity actuated upon pressurization of said cavity, said seal means impinges upon said snubber means so as to cause a frictional drag between the pin and housing to thereby dampen pivotal movement between the pin and housing.

4,572,568

TRUCK BED LINER SECURING DEVICE

Gregory W. Kapp, St. Joseph, and LeRoy Van Kirk, White Pigeon, both of Mich., assignors to LRV Corporation, Elkhart, Ind.

Filed Sep. 17, 1984, Ser. No. 651,334
Int. Cl.[4] B62D *33/00*
U.S. Cl. 296—39 R 12 Claims



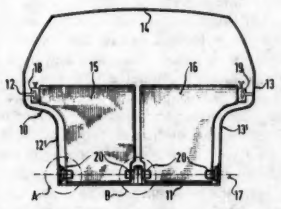
1. In combination, a truck bed having front and side walls with inwardly extending upper edges and lips extending downwardly therefrom, a liner for said bed having a bottom panel with front and side walls extending upwardly therefrom, a plurality of securing devices slidably securing the liner walls to the respective truck bed side walls, each of said devices having clamping means for engaging the downwardly extending lip of the truck wall, a back portion extending downwardly from said clamping means and generally parallel with the liner wall, a base portion extending outwardly from said back portion to contact the inner surface of the bed side wall, and fastening means extending through the liner wall and into said back portion to hold the liner wall thereto.

4,572,569

PIVOTABLE BACK-REST, PARTICULARLY FOR THE REAR BENCH SEATS IN MOTOR VEHICLES

Franz HaBmann, Gross-Bieberau, Fed. Rep. of Germany, assignor to General Motors Corporation, Detroit, Mich.

Filed Apr. 19, 1984, Ser. No. 602,123
Claims priority, application Fed. Rep. of Germany, May 3, 1983, 3316024
Int. Cl.[4] B60R *21/10*
U.S. Cl. 296—65 R 9 Claims



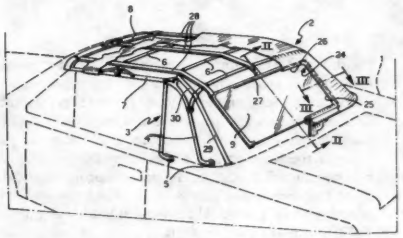
1. A pivotable back rest assembly for use in an automotive vehicle having body support structure, said back rest assembly comprising a back rest and hinge means for pivotally supporting said back rest for movement between an upright seat occupying position and a generally horizontal cargo carrying position, said hinge means including stationary hinges adapted to be secured to the vehicle body structure and having guide slot means therein and pairs of vertically spaced hinge pins carried by the back rest and extending laterally thereof, each of said pairs of hinge pins being slidably received within one of said guide slot means of a stationary hinge means and with the latter supporting said back rest for pivoting movement about an axis variable in height when the back rest is moved between its positions, the improvement being that said guide slot means are generally Y-shaped to define first and second intersecting guide paths to guide the movement of said hinge pins so as to enable said back rest to be moved between its generally upright and horizontal positions and that said stationary hinges are provided with an upwardly facing opening adjacent the fork of the generally Y-shaped guide slot means for allowing entry and removal of the hinge pins on the back rest into and out of the guide slot means to enable the back rest to be readily assembled to and disassembled from the stationary hinges.

4,572,570

FLEXIBLE TOP FOR SOFT-TOP MOTOR VEHICLES

Dario Trucco, Turin, Italy, assignor to Industrie Pininfarina S.p.A., Italy

Filed Jun. 15, 1984, Ser. No. 620,971
Claims priority, application Italy, Jun. 16, 1983, 53471/83[U]
Int. Cl.[4] B60J *1/00*
U.S. Cl. 296—107 5 Claims



1. A flexible top for soft-top motor vehicles having an articulated framework which can assume an extended condition covering the passenger compartment of the motor vehicle and a folded, noncovering condition, wherein the improvement consists in:

said flexible top including rigid glass rear window, a strip of flexible material having one longitudinal edge joined to the lower edge of said window and an opposite longitudinal edge joined to the body of the motor vehicle so that the window can be pivoted between a raised operative position and a lowered rest position in which it is received within said passenger compartment;

said flexible top defining an aperture in correspondence with said rear window so that, in the raised position of said window, the lateral and upper edges of the latter are in sealing contact with the inner surface of said top adjacent the edge of said aperture and

said flexible top being further provided with flexible connecting means which connect said rear window to said top in such a way as to maintain said window in its raised position when said top is in its extended covering condition,

whereby the rear window is automatically displaced between its operative position and its rest position solely by the manual movements of opening and closing top.

4,572,571

VEHICLE BODY FLOOR PAN ASSEMBLY

Donald E. Malen, Lathrup Village, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Jun. 11, 1984, Ser. No. 619,629
Int. Cl.[4] B62D *25/20*
U.S. Cl. 296—197 3 Claims

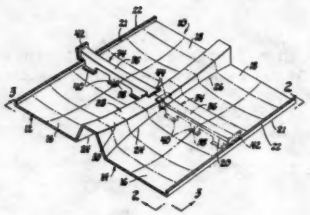
1. A vehicle body floor pan assembly comprising, in combination,

a pair of longitudinally extending floor pan units, each unit including a longitudinally arranged pair of floor pan sec-

tions, each section including longitudinal inner and outer edge portions and transverse forward and rearward edge portions joining the longitudinal edge portions,

each floor pan section being a vertical load reacting nonaxisymmetric membrane panel of shallow dish shape which accepts only vertical loads and is substantially free of surface indentations,

means securing the sections of each unit to each other at transverse adjoining forward and rearward edge portions thereof,



a longitudinal extending central tunnel member joining the longitudinal inner edge portions of the sections,

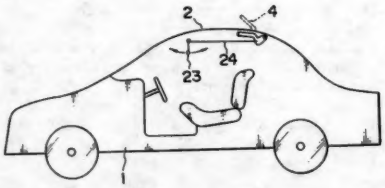
the central tunnel member including a catenary shape upper wall and side walls joining the upper wall to the inner longitudinal edge portions of each of the floor pan sections of the floor pan unit, the catenary shape upper wall of the central tunnel member accepting vertical loads from the membrane panels of the floor pan sections and reacting to such vertical loads with loads extending longitudinally of such upper wall.

4,572,572

LOCKING DEVICE OF HOOD FOR VENTILATOR WINDOW IN AUTOMOBILE

Shuji Nakamura, Kawasaki; Masami Koike, and Shigehiro Yasuki, both of Wako, all of Japan, assignors to Mitsui Kinzoku Kogyo K.K. and Honda Giken Kogyo K.K., both of Tokyo, Japan

Filed Apr. 11, 1984, Ser. No. 599,263
Claims priority, application Japan, Apr. 11, 1983, 58-63476
Int. Cl.[4] B60J *7/18*
U.S. Cl. 296—223 **6 Claims**



1. A locking device for a hood covering a ventilator window in an automobile, comprising:

means for pivotably connecting the rear portion of the hood to the automobile in the vicinity of the window;

a pinion gear mounted, below the window, for rotation about a first shaft;

means for rotating said pinion gear;

a pivotable element pivotably connected at a lengthwise intermediate portion thereof to said first shaft, said pivotable element having two ends, one of said ends including a second shaft; and

a rod having an upper end and a lower end, said upper end being pivotably connected to said hood at a third shaft supported at an intermediate location on said hood, and said lower end being pivotably connected to said second shaft,

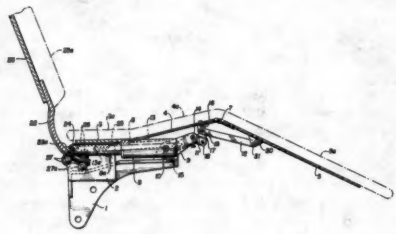
whereby when said hood is raised to an open position, the center of said second shaft is located rearwardly of an imaginary line passing through the centers of said first and third shafts, and when said hood is lowered to a closed position, the center of said first shaft is located forwardly of an imaginary line passing through the centers of said second and third shafts.

4,572,573

DENTAL CHAIR OPERATING APPARATUS

Noriyuki Yoshikawa, Ueno, and Kunio Fujiyama, Osaka, both of Japan, assignors to Takara Company, Somerset, N.J.

Filed Sep. 28, 1982, Ser. No. 425,302
Int. Cl.[4] A47C *1/035*
U.S. Cl. 297—75 **4 Claims**



1. A chair comprising:

(a) a frame

(b) a seat for receiving and supporting the body of a human, said seat being mounted and supported on said frame and comprising a hip underseat baseboard, upper thigh underseat baseboard and lower leg underseat baseboard

(c) a backrest means comprising a backrest baseboard attached to a flat curved strip member, means mounted between said frame and said strip member for guiding movement of said strip member in an arcuate path so that the movement of said backrest baseboard corresponds to movements of the human body and wherein said strip member is also attached to means for moving said strip member in the arcuate path, movement of said strip member positioning said backrest in various positions, from vertical to horizontal

(d) said upper thigh underseat baseboard movably mounted along one edge thereof to said hip underseat baseboard and movably mounted along an edge opposite said one edge to said lower leg underseat baseboard, and means for moving said upper thigh underseat baseboard in a substantially angular direction in a way corresponding to the natural movement of human thigh, while said backrest moves in a way corresponding to the movement of the hip, said movement of said upper thigh underseat concommitant with the movement of said, backrest by means connecting said backrest and underthigh underseat baseboard and;

(e) said lower leg underseat baseboard having means interconnected to said upper thigh underseat baseboard for moving said lower leg underseat baseboard concommitant with the movement of said backrest and upper thigh underseat baseboard in a manner corresponding to the natural movements of human lower leg,

(f) said means for guiding said strip member in an arcuate path including at least one pair of opposed cylindrical guide rollers, said rollers straddling said strip member and extending contiguously across the surface of said strip member substantially transverse to the linear longitudinal axis of said strip member along said longitudinal axis, so as

to guide the motion of said strip member along said longitudinal axis.

4,572,574

COLLAPSIBLE TABLE STRUCTURE WITH INTERCONNECTED BENCH SEATS

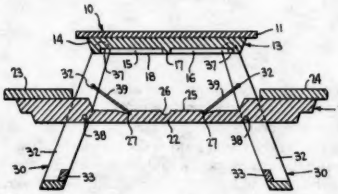
Nikolaus Fischhaber, Wackersberger Strasse 42, and Johann Ronge, Scharfreiter Strasse 20 A, both of 8172 Lenggries, Fed. Rep. of Germany

Filed Mar. 8, 1985, Ser. No. 709,710

Claims priority, application Fed. Rep. of Germany, May 9, 1984, 8413990

Int. Cl.⁴ A47B *3/14*

U.S. Cl. 297—159 **5 Claims**



1. A collapsible table structure with interconnected bench seats which comprises

a table assembly, said table assembly including a generally rectangular table top and two cross braces positioned transversely thereunder for supporting said table top, each cross brace including two collinear slideways therein;

a seat assembly, said seat assembly including two beam members which are transversely positioned with respect to said table top and two bench seats which are longitudinally positioned relative to said table top and which are mounted on corresponding ends of said beam members; each beam member including two retainer means therein along its length, and

two leg assemblies, each leg assembly being associated with an opposite side of said table top, each leg assembly including two leg members and a connection bar connected therebetween, each leg member including (1) an upper mounting bolt located at its upper end, said upper mounting bolt slidingly extending within one of the slideways of the associated cross brace, (2) a lower mounting bolt located along its length, said lower mounting bolt extending through an associated beam member, and (3) a pivoting support arm located between said upper and lower mounting bolts, said pivoting support arm having a free end, said pivoting support arm being capable, when said table structure with interconnected bench seats is set up for use, of being oriented so that its free end connects with a corresponding retainer means, and, when said table structure with inter-connected bench seats is collapsed for storage, of being reoriented so that its free end is dissociated with its corresponding retainer means, said leg assemblies, said seat assembly and said table assembly becoming repositionable relative to one another to form a compact, generally flat unit.

4,572,575

BICYCLE TYPE SEAT

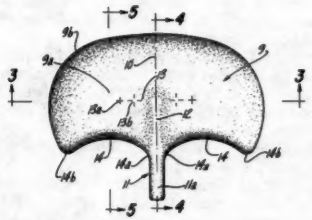
Robert C. Golden, 31996 Riverdale, Mt. Clemens, Mich. 48045, and Martin J. Neumeyer, 517 Hampshire, Utica, Mich. 48087

Filed Sep. 27, 1982, Ser. No. 423,582

Int. Cl.⁴ B62J *1/00*

U.S. Cl. 297—195 **19 Claims**

1. A seat adapted for use with a bicycle, said seat having a major rump supporting surface and a forward extension, said extension having sides parallel to and spaced by a front-to-rear midline of said major surface and projecting forwardly from the forward edge of said major surface, and means for providing support for the major forward portion of the buttocks along the physiological folds between the buttocks and the posterior portions of the thighs of the occupant and at the juncture of said folds with the lateral forward portions of the perineum of the occupant, said means comprising a pair of buttock front support lips defining the forward edges of said major surface at opposite sides respectively of said extension,



each lip having a lateral extent between inner and outer ends merging respectively with said extension and the lateral edge of said major surface, each lip comprising a compound curve curving forwardly and downwardly throughout its lateral extent and also curving rearwardly from both its inner and outer ends, such that the midpoint of said lateral extent measured along its curvature is rearward of both said inner and outer ends, the peripheral portions of said major surface rearwardly of said outer ends of said lips curving upwardly.

4,572,576

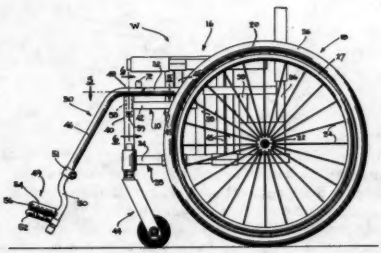
WHEELCHAIR WITH SWINGABLE FOOT SUPPORT ASSEMBLIES

Jeffrey P. Minnebraker, Van Nuys, Calif., assignor to Quadra Wheelchairs, Inc., Westlake Village, Calif.

Filed Aug. 20, 1984, Ser. No. 642,104

Int. Cl.⁴ A47C *7/50*

U.S. Cl. 297—429 **15 Claims**



1. A wheelchair having moveable foot supports thereon moveable from a position which supports a users foot in normal use to a position swung outwardly therefrom, said wheelchair comprising:

(a) a pair of laterally spaced apart longitudinally extending side frames,

(b) at least one of said side frames having a main frame section with a generally horizontally disposed tubular frame member having an interior central bore, said side frame also having a front frame section generally longitudinally aligned with the main frame section when in normal use, said front frame section having a tubular frame member with an interior bore which is aligned with the tubular frame member and interior bore on the main frame section in normal use,

(c) a foot support mounted on and carried by said front

frame section and adapted to be located in a frontal region of said wheelchair when in use for support of the foot of a user,

(d) pivot means pivotally mounting the front frame section to the main frame section and enabling said front frame section to be angularly shifted out of the plane of the main frame section where it is normaly generally aligned therewith, and to carry therewith said foot support to thereby enable a user easy and convenient entry and exit, and

(e) releasable locking means for normally retaining said front frame section and main frame section in a generally aligned position of normal use, said releasable locking means comprising:

(1) a shiftable locking plunger disposed within the bore of one of said front frame tubular frame member or main frame tubular frame member and adapted to extend into the bore of the other to hold the front frame member in locking position in a normal use,

(2) an opening in one of said frame members having the locking plunger therein,

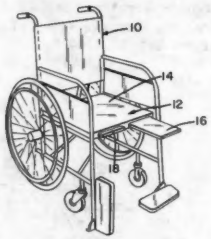
(3) an engagable member connected to said locking plunger and extending outwardly through said opening to be engagable by a user to shift the locking plunger out of the frame member which it holds in locked position of normal use to thereby release the front frame section thereby allowing the latter to pivot about said pivot means.

4,572,577

PORTABLE SEAT HAVING SLIDABLE LEG-SUPPORTING SECTIONS FOR LEG AMPUTEES

Adrian J. LaRue, 300 Beechwood La., Elizabethtown, Pa. 17022

Filed Aug. 13, 1984, Ser. No. 639,844
Int. Cl.[4] A47C *7/50*
U.S. Cl. 297—430 **9 Claims**



1. A portable seat for a leg amputee that may be positioned on any support such as a chair to provide a support for the leg amputee and the residual limb, comprising:

a seat section on which the amputee can sit; and

a leg supporting section slidably positioned in said seat section so as to be within said seat section in a nonleg-supporting position and to be slidable from within said seat section to a leg-supporting position in a substantially horizontal position to support the residual limb of the amputee.

4,572,578

BACK REST

Patricia A. Perkins, 118 S. Fairacres Rd., Las Cruces, N. Mex. 88005

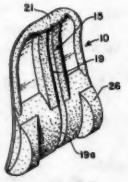
Filed Aug. 8, 1984, Ser. No. 638,757
Int. Cl.[4] A47C *7/02*
U.S. Cl. 297—460 **7 Claims**

1. A back rest comprising:

(a) a frame having a front surface, a rear surface, an upper portion defining a cervical-thoracic area and a lower portion defining a lumbo-sacral area, said upper portion being concave and said lower portion being convex as viewed from the front, said frame having the shape of a shallow S in vertical section,

(b) a cervical support affixed to and projecting forwardly from the upper end of the upper portion of the frame,

(c) a thoracic support affixed to the frame and extending forwardly therefrom and downwardly from the cervical support along the longitudinal median line of the frame,



said support being formed with a groove along its midline to receive bony spinal prominences,

(d) a lumbo-sacral support affixed to and extending forwardly from the lower part of the frame and downwardly from the thoracic support, said lumbo-sacral support having a groove which forms a continuation of the groove in the thoracic support,

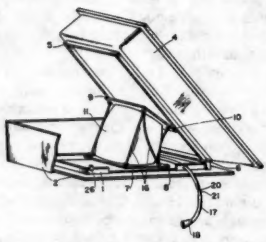
said supports being of resilient material.

4,572,579

DUMP APPARATUS

Ken Saito, 2-51-30, Tama-chɔ, Fuchu-shi, Tokyo, Japan

Filed Dec. 19, 1983, Ser. No. 563,138
Int. Cl.[4] B60P *1/16*
U.S. Cl. 298—1 A **5 Claims**



1. A dump apparatus comprising:

(a) a base frame removably mounted on a rear body of a motor truck;

(b) a frame pivotally connected, at an end portion thereof, to an end portion of said base frame;

(c) a loading box fixedly mounted on said frame;

(d) an upper member pivotally connected, at an end thereof, to said frame;

(e) a lower member pivotally connected, at an end thereof, to said base frame in association with said upper member;

(f) an inflatable bag, which is made of a material composed of neoprene and nylon fiber having a heat resistance of about 130 C. and a pressure resistance of about 0.8 kg/cm^2, disposed between said upper member and said lower member, and fixed to said upper member in the top thereof and to said lower member in the bottom thereof, respectively, by an adhesive;

(g) a plurality of parallel flexible strut members disposed between, and connected to, said upper member and said lower member with at least one strut located on each side of the bag, so as to restrict excessive inflation of said inflatable bag; and

(h) a hose connected, at an end thereof, to said inflatable bag communicating with the interior of said inflatable bag and having, at the opposite end thereof, a coupler for an exhaust tube of the truck.

4,572,580

MOBILE CONCRETE OR ROCK CUTTING APPARATUS

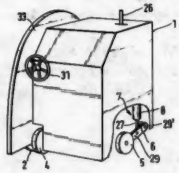
Hans Bieri, Pfaeffikon, Switzerland, assignor to Hydrostress AG, Pfaeffikon, Switzerland

Filed Jan. 9, 1984, Ser. No. 569,178

Claims priority, application Switzerland, Jan. 21, 1983, 350/83

Int. Cl.⁴ E21C *25/20*

U.S. Cl. 299—1 **19 Claims**



1. A mobile apparatus for cutting hard materials, such as concrete, comprising a machine frame, wheel means for supporting said machine frame, a circular saw blade, saw blade mounting means for rotatably mounting said circular saw blade in said machine frame to take up a predetermined cutting position, saw blade position sensor means operatively arranged for sensing the instantaneous position of said saw blade, and saw blade position correction means in said machine frame responsive to said position sensor means for automatically maintaining said saw blade in said predetermined cutting position even if said machine frame travels on a slanted or uneven surface, wherein said saw blade position sensor means comprise pendulum means and at least one sensing member operatively arranged for sensing the instantaneous position of said pendulum means, wherein said saw blade position correction means comprise power drive means operable in response to said sensing member for maintaining said saw blade in said predetermined position, and wherein the position of said sensing member relative to said pendulum means is adjustable in the direction of pendulum excursions.

4,572,581

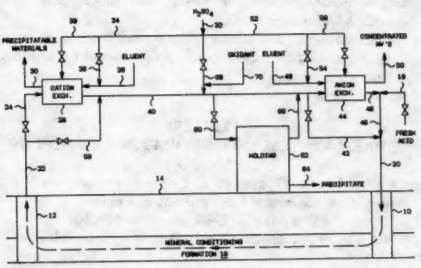
IN-SITU RECOVERY OF MINERAL VALUES

Robert L. Horton, South Russell, Ohio, assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed May 6, 1983, Ser. No. 492,279

Int. Cl.⁴ E21C *41/14*

U.S. Cl. 299—4 **4 Claims**



1. A method for the recovery of uranium from a subsurface earth formation containing uranium and iron in a form which reacts with sulfuric acid to form precipitates, comprising:

(a) injecting into at least one injection well an aqueous acidic treating agent including an aqueous solution of citric acid in a concentration sufficient to solubilize a significant amount of iron;

(b) passing said aqueous acidic treating agent through said subsurface formation for a time and under conditions sufficient to solubilize a significant amount of iron;

(c) withdrawing said aqueous acidic treating agent containing the thus solubilized iron from at least one production well;

(d) passing the thus withdrawn aqueous acidic treating agent containing said solubilized iron through a cation exchange material to remove said solubilized iron from said aqueous acidic treating agent and produce a reuseable aqueous acidic treating agent;

(e) repeating steps (a) through (d) at least once with said reuseable aqueous acidic treating agent;

(f) thereafter injecting a sulfuric acid leach solution, adapted to extract significant amounts of uranium from said subsurface formation, into said injection well;

(g) contacting said subsurface formation with said sulfuric acid leach solution under conditions and for a time sufficient to extract significant amounts of uranium from said subsurface formation and produce a pregnant leach solution containing the thus solubilized uranium; and

(h) withdrawing said pregnant leach solution from said production well.

4,572,582

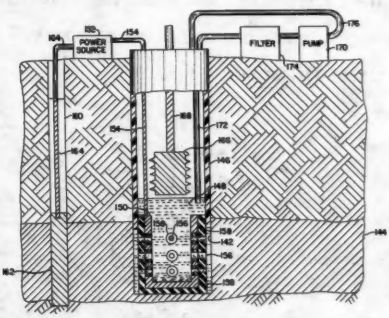
METHOD OF MINING METALS LOCATED IN THE EARTH

John J. Ryeczek, R.D. #1, Box 190C, Point Marion, Pa. 15474

Division of Ser. No. 384,781, Jun. 4, 1982, Pat. No. 4,457,988. This application Apr. 13, 1984, Ser. No. 599,994

Int. Cl.⁴ E21C *41/06, 41/14*

U.S. Cl. 299—5 **8 Claims**



1. Method of mining metals located in the earth consisting essentially of:

(a) drilling a first hole from the earth's surface into a metal to be mined;

(b) placing an electrolyte into the hole and in contact with the metal;

(c) positioning a recovery electrode within the hole and at least partially immersed in the electrolyte;

(d) making electrical contact with the metal;

(e) passing an electric current through the metal, electrolyte, and recovery electrode whereby the metal functions as an anode and the metal will be deposited on the recovery electrode;

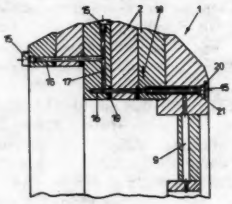
(f) removing the deposited metal from the recovery electrode.

4,572,583

CUTTING HEAD FOR DRIFT ADVANCING MACHINES AND PROCESS FOR PRODUCING SAME

Gottfried Traumüller; Wilfried Maier, both of Zeltweg; Franz Schöffmann, Leoben, and Herwig Wrulich, Zeltweg, all of Austria, assignors to Voest-Alpine Aktiengesellschaft, Vienna, Austria

Filed Sep. 2, 1983, Ser. No. 528,788
Claims priority, application Austria, Sep. 3, 1982, 3310/82
Int. Cl.[4] E21C *7/08;* E21F *5/02*
U.S. Cl. 299—81 **8 Claims**



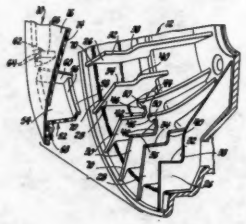
1. A cutting head for drift advancing machines comprising a cutting head base, said base comprising a plurality of adjacent hollow annular disc-shaped bits, the bits abutting one another along their axial faces and welded together along their innermost abutting surfaces thereby forming a weld bead, the bits further comprising a radial passage extending through the bit for discharging a cooling fluid from the bit, said radial passage connected to an axially arranged bore which extends through the bits and the weld bead.

4,572,584

PLASTIC WHEEL COVER RETENTION ARRANGEMENT

Trevor J. Brown, Rochester, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Jun. 23, 1981, Ser. No. 274,750
Int. Cl.[4] B60B *7/00*
U.S. Cl. 301—37 TP **3 Claims**



1. A wheel cover retention arrangement for retaining a plastic wheel cover to a wheel, comprising,

first and second axially and radially extending ramps on the wheel circumferentially spaced about the wheel and being sloped oppositely of one another,

the second ramp terminating in a radially extending cover retention means,

an axially extending radially flexible member on the wheel cover including an axially extending wall portion and a retention portion cooperatively interlockable with the retention means to retain the cover to the wheel, the wall portion and first ramp being generally equally radially spaced from the wheel axis and the retention portion and second ramp being generally differentially radially spaced from the wheel axis,

means locating the wall portion and retention portion in registry with their respective ramps,

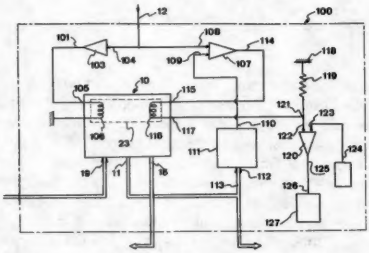
axial movement of the cover relative to the wheel slidably engaging the wall portion with the first ramp and the retention portion with the second ramp, the differential radial spacing of the wall portion and retention portions relative to the ramps acting to radially twist the flexible member relative to the cover, the retention portion moving past the axial limit of the second ramp and to cooperatively interlock with the retention means and allow the flexible member to substantially untwist.

4,572,585

SYSTEM FOR CONTROLLING A BRAKE ACTUATOR ON A VEHICLE, PARTICULARLY AN AIRCRAFT

Jean Guichard, La Gareane Colombes, France, assignor to Messier-Hispano-Bugatti, France

Filed Mar. 4, 1983, Ser. No. 472,328
Claims priority, application France, Mar. 5, 1982, 82 03669
Int. Cl.[4] B60T *13/68*
U.S. Cl. 303—3 **4 Claims**



1. A system for controlling a brake actuator, said system comprising:

first means for generating a first electrical control signal;

a controllable fluid source for delivering fluid to outlet means from said source at a pressure which varies as a function of said first control signal applied thereto;

second means for connecting the outlet of said fluid source to said brake actuator;

third means for measuring the value of the pressure at said outlet from said source, said third means including means for delivering a second signal having a value representative of said measured pressure;

means for controlling said source of fluid as a function of said first and second signals in such a manner that the fluid pressure at the outlet from said source has a value which is a predetermined function of said first signal;

means for generating a third signal as a function of said second signal,

first comparator for comparing said third signal with a fourth, reference signal,

and alarm means and wherein the output from said comparator means is connected to said alarm means for controlling said alarm means.

4,572,586

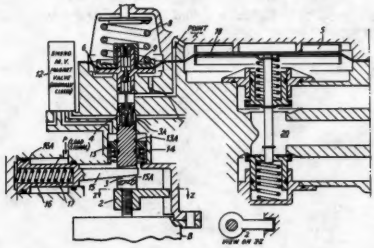
BRAKE SYSTEM INCORPORATING A STEPPING MOTOR

Jack Washbourn, Chippenham, England, assignor to Westinghouse Brake & Signal Co., Wiltshire, England

Filed May 2, 1984, Ser. No. 606,264
Claims priority, application United Kingdom, May 3, 1983, 8312025
Int. Cl.[4] B60T *13/68*
U.S. Cl. 303—15 **7 Claims**

1. An electro-pneumatic brake system in which an output

pneumatic pressure is determined by the opening, in accordance with an electrical signal, of a pneumatic valve, said system comprising a pneumatic valve responsive to a source of pneumatic pressure, two relatively movable members arranged so that a first of the members is movable in an axial direction responsive to rotation of the second member, said first member



being connected to the valve, and a stepping motor, having a step-wise rotatable output shaft connected to said second member, for, responsive to the receipt of a said electrical signal, controlling the opening of the pneumatic valve in a series of digital steps so as to provide, downstream of the pneumatic valve, control of the output pneumatic pressure in a variable manner in a series of digital steps.

4,572,587

ROAD WHEEL FOR A TRACK-LAYING VEHICLE

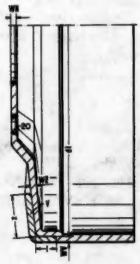
Uwe Komp; Klaus Henke, both of Dortmund, and Johannes Wozniak, Lippstadt, all of Fed. Rep. of Germany, assignors to Hoesch Werke AG, Dortmund, Fed. Rep. of Germany

Filed Dec. 9, 1983, Ser. No. 559,798

Claims priority, application Fed. Rep. of Germany, Dec. 11, 1982, 3245910

Int. Cl.⁴ B62D *55/14;* **B21H** *1/02;* **B21K** *1/28*

U.S. Cl. 305—56 **10 Claims**



1. A road wheel for a track-laying vehicle comprising a pair of wheel halves secured together and unitarily defining a cylindrical running surface directly engageable with a track and an outwardly open channel adapted to receive teeth of said track, each wheel half being formed in one piece from a circular steel disk of a thickness D and having a planar hub portion lying perpendicular to an axis of rotation of said wheel, a steeply conical transition portion connected to said hub portion and defining porjection angle b with a plane perpendicular to said axis, a tooth-flanking portion of slight conicity connected to said transition portion and defining a projection angle a with a plane perpendicularly to said axis, and a cylindrical running portion forming said surface, all of said portions being centered on said axis, the wall thickness WU of said transition portion being equal to the product of the thickness D of said disk and the cosine of the projection angle b, the wall thickness WZ of the tooth-flanking portion being equal to the product of the thickness D of said disk with the cosine of the respective projection angle a, and the wall thickness WL of said cylindrical portion being between substantially 0.6D and 0.8D, said hub portion having a wall thickness WN of 0.5D to 0.7D.

4,572,588

CONNECTING ELEMENTS FOR CRAWLER TRACK VEHICLE CHAINS PURSUANT TO THE DUALLY-HINGED PIN PRINCIPLE

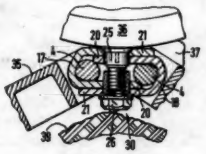
Hagen-Heinz Wiesner, Solingen, and Heinz E. Mattern, Remscheid, both of Fed. Rep. of Germany, assignors to Diehl GmbH & Co., Nuremberg, Fed. Rep. of Germany

Filed Feb. 27, 1984, Ser. No. 583,941

Claims priority, application Fed. Rep. of Germany, Mar. 1, 1983, 3307107

Int. Cl.⁴ B62D *55/21*

U.S. Cl. 305—58 PC **12 Claims**



1. In connecting elements for interconnecting adjoining chain link members of crawler track vehicle chains including a pair of dually-hinged link pins; including connectors extending between and into recesses in the chain link members; the improvement comprising: each of said connectors including two clamps having arms overlappingly insertable into each other, a screw connection for clampingly fastening said clamps to the link pins of said adjoining chain link members, each said clamp form-fittingly encompassing respectively one said link pin, each said link pins having a cross-section deviating from a circular cross-section in at least the region being grippingly engaged by said clamps.

4,572,589

JOURNAL BEARING

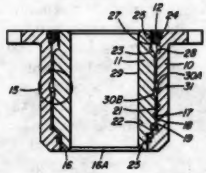
Kenneth M. White, Calgary, Canada, assignor to Western Rock Bit Company Limited, Calgary, Canada

Filed Mar. 29, 1985, Ser. No. 717,961

Claims priority, application Canada, Apr. 12, 1984, 451864

Int. Cl.⁴ F16C *29/12*

U.S. Cl. 308—4 R **10 Claims**



1. A guide bushing for maintaining alignment of a rotary shaft comprising an outer housing adapted to be carried by a support, an axial borehole extending therethrough and defining at least two bearing surfaces, one of said bearing surfaces being an inner annular bearing surface, the other being an angled bearing surface located below the inner annular bearing surface and angled such that at a point proximal to the inner

annular bearing surface the diameter of the borehole is greater than at a point remote from the inner annular bearing surface; an internal sleeve rotatably contained within the borehole and spaced slightly from the outer housing to form a small annular clearance space therebetween, the sleeve having at least two bearing surfaces, one of said bearing surfaces being an outer annular bearing surface, the other being an angled bearing surface located below the outer annular bearing surface and angled in a manner complementary to the angled bearing surface of the outer housing; opposed annular grooves in the inner annular bearing surface of the housing and the outer annular bearing surface of the sleeve, at least one of the grooves being axially elongate, and ball bearings in the grooves and spanning the annular space and in conjunction with the angled bearing surfaces providing support for the sleeve within the outer housing, the sleeve having a borehole extending therethrough for unimpeded reception of the rotary shaft, whereby when the rotary shaft tends to move laterally and contact the sleeve the coacting angled bearing surfaces and the annular bearing surfaces take the load.

4,572,590

LINEAR BALL BEARING UNIT

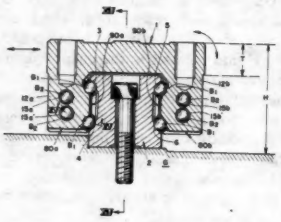
Hiroshi Teramachi, 2-34-8, Higashi-Tamagawa, Setagaya-ku, Tokyo, Japan

Filed May 16, 1983, Ser. No. 494,914

Claims priority, application Japan, May 20, 1982, 57-85435

Int. Cl.⁴ F16C *29/06*

U.S. Cl. 308—6 C **3 Claims**



1. In a linear ball bearing comprising:

a bearing body having a horizontal and vertical axis and having a pair of skirts with opposed inner surfaces wherein said skirts are provided on their opposing inner surfaces with two pairs of longitudinally extending ball-rolling grooves for loaded balls, and two pairs of passage bores for non-loaded balls extending in the longitudinal direction;

a track shaft provided at its opposite side surfaces with two pairs of ball-rolling grooves extending in the longitudinal direction in face-to-face relation with the corresponding ball-rolling grooves in the bearing body; and

a pair of lids attached to the both ends of the bearing body and each having four ball-return grooves for connecting the opposed ball-rolling grooves in the bearing body and the track shaft with the corresponding passage bores in the bearing body; the improvement in which

(a) said ball rolling grooves are arranged symmetrically with respect to said horizontal and vertical axes and said bearing body and said track shaft are arranged with an angle of contact between the loaded balls and the ball-rolling grooves in the bearing body and the track shaft set to be about 45 degrees; and

(b) each skirt has a central portion and the passage bores for the non-loaded balls are disposed substantially in the central portion of each skirt in symmetry with respect to said horizontal and vertical axes and in close proximity to said horizontal axis and near said ball rolling grooves.

4,572,591

BALL BEARING ARRANGEMENT FOR LONGITUDINAL MOVEMENT ON A SHAFT OR THE LIKE

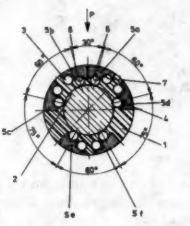
Lothar Walter, Schweinfurt; Walter Reith, Bad Bocklet, and Otmar Winkler, Schweinfurt, all of Fed. Rep. of Germany, assignors to SKF Kugellagerfabriken GmbH, Schweinfurt, Fed. Rep. of Germany

Filed Aug. 9, 1984, Ser. No. 639,100

Claims priority, application Fed. Rep. of Germany, Sep. 2, 1983, 8325205[U]

Int. Cl.⁴ F16C *29/06*

U.S. Cl. 308—6 C **6 Claims**



1. In a ball bearing arrangement for longitudinal movement on a shaft or the like and comprising an at least partially sleeve-shaped cage with a plurality of substantially axially aligned recesses formed in the radially outer surface of said cage and a plurality of guideways for guiding load-bearing balls during movement, each said guideway comprising an aperture extending between one of said recesses and the bore of said cage, a plurality of raceway plates inserted in said recesses, and a plurality of endless rows of balls arranged between said raceway plates and said cage, the improvement wherein each of said raceway plates is formed with a closed raceway on the inner radial side thereof for guiding an endless row of said balls, said closed raceway comprising an axially extending load-bearing raceway portion, an axially extending return travel raceway portion, and a pair of reversal raceway portions joining the load-bearing and return travel raceway portions of the respective plate, the angular distances between load-bearing raceway portions of adjacent plates varying about the circumference of said cage.

4,572,592

REMOVABLE DISPLAY SCREEN BEZEL

Kenneth R. Haven, Fremont, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Jul. 9, 1984, Ser. No. 628,882

Int. Cl.⁴ A47B *81/06*; H04N *5/645*

U.S. Cl. 312—7.2 **10 Claims**

1. A removable bezel apparatus for a display screen comprising:

a frame;

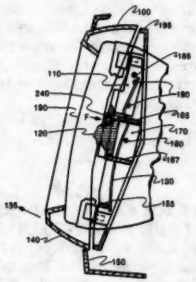
a first member disposed to abut the display screen including a protrusion having distal and proximal extremes, said distal extreme forming a monotonically increasing curve with the proximal extreme;

a second member, mounted on said frame, having two parallel guides spaced apart a distance approximately equal to distal extreme of said protrusion on the first member, said protrusion on the first member being slideably engageable with said guides;

a third member pivotally mounted on said frame in releaseable engagement with said protrusion at said proximal extreme; and

a fourth means, mounted on said frame between said guides of said second member, disposed orthogonally therein, said protrusion on the first member being slideably engageable with said fourth member;

a resilient means coupled from said frame to the third member for engaging said protrusion of the first member and



urging into position the first member against the display screen.

4,572,593

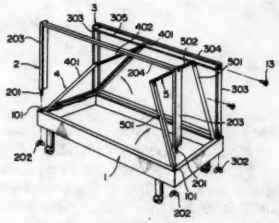
DISPLAY CASE

Daisuke Takamizawa, 29-14, Wakabayashi 3-Chome, Setagaya-ku, Tokyo; Aguri Okada, No. 75, Kuramatsu, Sugitomachi, Kitakatsushika-gun, Saitama-ken, and Hisayoshi Ito, 13-25, Shimizugaoka 3-Chome, Fuchu-shi, Tokyo, all of Japan

Filed Jun. 12, 1984, Ser. No. 619,822

Int. Cl.[4] A47F *7/00*

U.S. Cl. 312—114 **4 Claims**



1. A display case comprising an inverted U-shaped front frame and an inverted U-shaped rear frame, both ends of each frame being separably mounted on four corners of a bed frame; a left and a right square side frame, the lower portions of both side frames being mounted by hinges interiorly of both left and right sides of the bed frame, said both left and right side frames being able to be laid down and housed within the bed frame and able to be erected internally of the front frame and the rear frame, said both erected left and right side frames being separably secured to the front frame and to the rear frame; transparent sliding doors in the front frame and in the rear frame; and transparent glass plates in both left and right square side frames and on the upper surface of the display case.

4,572,594

ARTHROSCOPY SUPPORT STAND

C. Bruce Schwartz, 6594 Mill Creek Rd., The Dalles, Oreg. 97058

Filed Feb. 8, 1984, Ser. No. 578,221

Int. Cl.[4] B01L *9/02*

U.S. Cl. 312—209 **22 Claims**

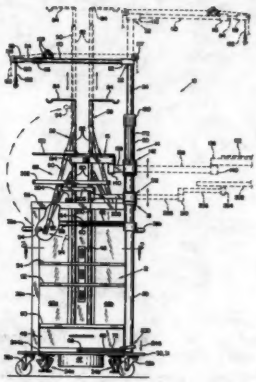
1. An arthroscopic support stand, comprising:

means defining a cabinet having a base, opposite sides, a front, a top and shelves extending between the sides of the cabinet for supporting electrical equipment for use in performing arthroscopic surgery;

a vertical support column having a lower portion extending above the top of the cabinet and a vertically telescoping upper portion received in the lower portion;

mounting means for connecting the support column to the cabinet and supporting it thereon in a predetermined lateral position in front of the shelves and at one side of the cabinet adjacent a patient and out of the way of the shelves to facilitate ready access to the electrical equipment in the cabinet;

a television monitor support means including an articulated arm pivotally mounted on the lower portion of the support column extending radially outward therefrom for



supporting a television monitor, operatively connected to a television camera, in position above the cabinet top for viewing by a surgeon operating upon a predetermined portion of the patient;

joint means movably connecting the monitor support arm to the lower portion of the support column for vertical movement along and rotation around the lower portion of the support column to selectively position the monitor at a predetermined elevation and radial position, and

locking means for locking the joint means solely against said vertical movement and thereby fixing the vertical position of the monitor support means and monitor such that the monitor can be readily positioned vertically and rotationally in any selected position above the cabinet including over the patient for viewing by the surgeon.

4,572,595

ROTATIONAL SHELF APPARATUS

Chapman C. Craig, 2228 Houser Rd., Knoxville, Tenn. 37919

Filed Apr. 13, 1984, Ser. No. 600,083

Int. Cl.[4] A47B *11/00;* **A47F** *3/10*

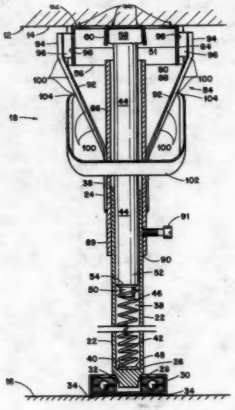
U.S. Cl. 312—305 **19 Claims**

1. A rotational shelf apparatus for being releasably mounted in a cabinet or other storage area, said cabinet or other storage area being provided with first and second facing installation surfaces, said apparatus comprising:

a rotating support shaft having first and second end portions, said support shaft being provided with a coaxial hole at said first end portion defining a spring housing for slidably receiving a spring member, said spring member comprising first and second end portions, said second end portion of said support shaft being provided with means for rotatably engaging said second installation surface of said cabinet or other storage area, said means comprising a bearing member provided on one face with a receptor for rotatably receiving said second end portion of said support shaft, said bearing member also being provided on an

opposite face with a friction producing surface for releasable engagement with said second installation surface to hold said bearing member in a preselected position on said second installation surface;

a stationary support rod having first and second end portions, said second end portion of said support rod being slidably received in said hole of said first end portion of said support shaft in telescoping fashion such that said



second portion of said support rod releasably engages said first end portion of said spring member, said spring member serving to bias said support rod in the direction of said first installation surface of said cabinet or other storage area, said first end portion of said support rod being provided with means for releasably engaging said first installation surface; and

at least one support structure mounted on said rotating support shaft.

4,572,596

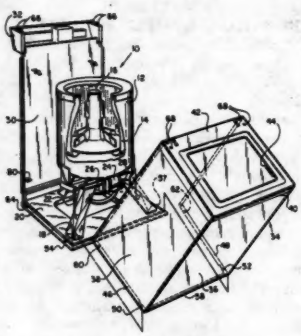
METHOD AND APPARATUS FOR ASSEMBLING A CABINET FOR AUTOMATIC WASHERS

Robert M. Weir, St. Joseph, and Dean R. Sommerfeld, Lincoln Township, Berrien County, both of Mich., assignors to Whirlpool Corporation, Benton Harbor, Mich.

Filed Mar. 30, 1984, Ser. No. 595,526

Int. Cl.[4] A47B *47/05*

U.S. Cl. 312—257 R **10 Claims**



9. A cabinet comprising:

a base frame;

a vertical rear panel attached to one side of said base frame;

a detachable vertical front wall with attached vertical side walls;

said side walls canted inwardly when said front wall is detached so that the ends attached to said front wall are farther apart than the opposite free ends, said free ends having inwardly directed flanges with angled lower ends,

guide pins secured to said rear wall near the lower side edges spaced to engage said angled lower ends of said flanges upon assembly of said cabinet,

whereby said side walls are caused to be spread outwardly to align with said side edges of said rear wall.

4,572,597

COVER FOR RACK CABINETS, PARTICULARLY FOR DATA PROCESSING EQUIPMENT

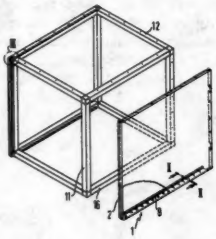
Ulrich Voigt, Munich; Leopold Hör, Augsburg, and Werner Stoebrich, Biberbach, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Feb. 29, 1984, Ser. No. 584,895

Claims priority, application Fed. Rep. of Germany, Mar. 22, 1983, 8308487[U]

Int. Cl.[4] A47B *47/03*

U.S. Cl. 312—257 SK **8 Claims**



1. A cover for a rack-type cabinet, which cabinet comprises a frame comprising upper, lower, front and rear hollow tubes and a mounting plate carrying a plurality of aligned tabs extending along the front hollow tube, said cover comprising:

a cover panel including first, second, third and fourth sides;

said second, third and fourth sides each including a respective flange structure projecting generally perpendicular from said panel for frictionally engaging over said upper, lower and rear hollow tubes, respectively;

said first side comprising a rounded section comprising a distal end, and an angle-shaped flange carried by said distal end and including a first leg extending generally parallel to said cover panel and a second leg extending from said first leg towards and generally perpendicular to said cover panel; and

an electrostatic shield element carried by said second leg for frictionally engaging the plurality of tabs.

4,572,598

SALAD BAR FOR SUPERMARKETS AND RESTAURANTS

Franklin Moore, Jr., 902 McBurney Dr., Lebanon, Ohio 45036

Filed Nov. 17, 1983, Ser. No. 552,969

Int. Cl.[4] A47B *97/00, 57/00;* A47F *3/04*

U.S. Cl. 312—284 **7 Claims**

1. A salad bar for foods and adapted for self-serve use by persons obtaining foods therefrom, comprising:

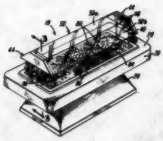
a base,

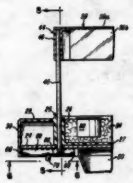
a table supported by the base,

a container supported by the table and adapted to contain foods,

a transparent cover member,

support means supporting the cover member for movement between a lower position in which the cover member encloses the container to prevent access to the container and an upper position in which the cover member is spaced above the container to permit access to the container by persons in self-serve use, while preventing contamination of the contents of the container by persons obtaining foods from the container,





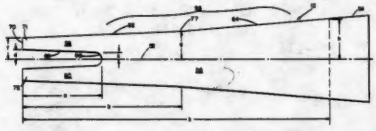
the support means including substantially vertical posts which are axially movable between an upper position and a lower position with respect to the table, means attaching the posts to the cover member, engagement means carried by the table and movable to a position below the posts to support the posts and the cover member in the upper positions thereof, the engagement means being movable to a position laterally spaced from the posts for positioning the cover member and the posts in the lower positions thereof.

4,572,599

WIPER FOR SLIDING ELECTRICAL CONTACT

Ryszard J. Pryputniewicz, Manchester, Conn.; John Clayton, Stow, and Robert A. Waters, Weston, both of Mass., assignors to Waters Manufacturing, Inc., Wayland, Mass.

Filed May 27, 1983, Ser. No. 498,968
Int. Cl.[4] H01R *39/18*; H01C *1/12, 10/32*
U.S. Cl. 339—5 R **13 Claims**



1. A wiper for making a sliding electrical contact with an electrically conductive material, said wiper being formed from a single continuous piece of electrically conductive and resiliently deformable material, and having a generally elongated shape, said wiper including a base portion at one end for attachment to mechanism for moving the wiper relative to said electrically conductive material, a body portion attached to said base portion at its proximal end, and a plurality of finger portions attached to the distal end of said body portion at their proximal ends and making contact with said conductive material at their distal ends, the improvement wherein

the cross sectional area of said body element decreases continuously from its proximal toward its distal end, and

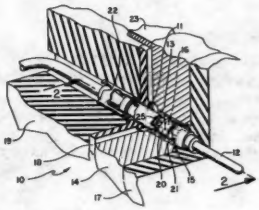
the cross sectional area of each of said fingers changes continuously from its proximal towards its distal end.

4,572,600

ELECTRICAL CONNECTOR FOR TRANSIENT SUPPRESSION

Gerald R. Nieman, Glendale, Ariz., assignor to ITT Corporation, New York, N.Y.

Filed Feb. 28, 1985, Ser. No. 706,683
Int. Cl.[4] H01R *4/66*; H03H *7/00*
U.S. Cl. 339—14 R **7 Claims**



1. An electrical connector member comprising:

an electrical connector shell:

a ground plane in said shell in electrical contact therewith, said ground plane having an opening therethrough;

a contact in said opening;

a circumferential insulator surrounding said contact inside said opening;

a circumferential conductive band surrounding said insulator inside said opening;

conductive spring means to mount said conductive band in said opening in a position electrically connected with said ground plane; and

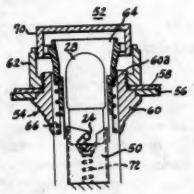
a circuit component electrically connected between said conductive band and said contact.

4,572,601

PUSH-PUSH BAYONET LAMP SOCKET

Jack E. Jones, Greendale; Michael J. Fajner, Bayside, and Ronald E. Zepnick, Greenfield, all of Wis., assignors to Eaton Corporation, Cleveland, Ohio

Filed Dec. 17, 1984, Ser. No. 682,720
Int. Cl.[4] H01R *13/625*
U.S. Cl. 339—46 **11 Claims**



1. A push-push lamp socket for a lamp bulb of the type having a base mounting a glass bulb enclosed illuminator with electric contact means on said base and radial mounting lugs on said base for securing said bulb in said socket, said lamp socket comprising:

a hollow socket member for receiving said lamp base and comprising:

recesses in the walls of said socket member for receiving said radial lugs as said base is inserted axially thereinto;

spring-biased connector means within said socket member for engaging said contact means;

and push-push latch means communicating with said recesses comprising:

latch means responsive to a first axial push of said lamp bulb into said socket against the bias of said connector means followed by disengagement thereof for securing said lamp

bulb by said lugs in a latched position and concurrently engaging said contact means to said connector means in said socket;

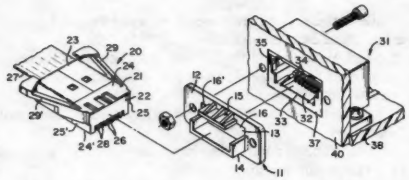
and release means responsive to a second axial push of said lamp bulb inwardly of said latched position against the bias of said connector means followed by disengagement thereof for releasing said lugs from said latched position for removal of said lamp bulb.

4,572,602

ELECTRICAL CONNECTOR ASSEMBLY WITH GUIDE MEMBER

David W. Rupnik, Mechanicsburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Oct. 31, 1984, Ser. No. 666,708
Int. Cl.[4] H01R *13/74*
U.S. Cl. 339—65 **3 Claims**



1. An electrical connector assembly comprising:

a plug comprising an insulating housing body having a front, mating end and a rear, wire receiving end; first and second opposed side walls joined by first and second opposed end walls extending between the mating and wire receiving ends; a row of barriers extending across the second side wall at the mating end; an internal wire receiving passageway open at the rear end and extending toward the mating end; a row of terminals having contact surfaces exposed between adjacent barriers and wire connecting portions terminating wires in the passageway; and, a pair of latch arms extending rearwardly in divergent fashion from respective end walls at locations adjacent the first side wall;

a receptacle comprising an insulating housing having opposite side and end walls defining a plug receiving cavity open at a mouth and a row of spring contacts extending rearwardly from a location adjacent and spaced from the mouth across the cavity for engagement with respective contact surfaces of the plug terminals on insertion of the plug through the mouth into the cavity, latching means being provided adjacent the mouth interengageable with the latch arms to latch the plug in the cavity;

a panel having an aperture therein; and,

a plug guiding member located to extend around the panel aperture and including a channel-form base portion outstanding from one side of the panel with the channel axis extending along the plug mating axis and an apron outstanding from the panel overlying the center of the channel, latch admitting openings being provided between respective channel side walls and the upper apron portion;

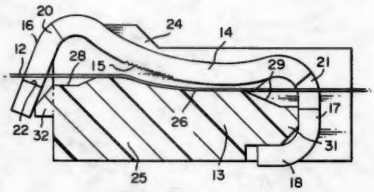
wherein the receptacle is mounted on the other side of the panel with the mouth aligned with the panel aperture and the plug extends through the guide member in mating engagement with the receptacle with the channel snugly receiving the second side wall and adjacent portions of the end walls of the plug and the apron engaging a central portion of the first side wall with the latch arms being freely received in the openings.

4,572,603

CONNECTOR FOR TERMINATING SMALL GAUGE MAGNET WIRE

Charles H. Weidler, Lancaster, Pa., assignor to AMP, Incorporated, Harrisburg, Pa.

Filed Jun. 29, 1984, Ser. No. 625,997
Int. Cl.[4] H01R *4/24*
U.S. Cl. 339—97 R **12 Claims**



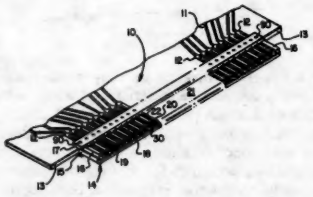
1. An electrical connector for small gauge magnet wire comprising a resilient metal terminal stamped and formed in one piece with a strip-form wire engaging portion, a wire engaging surface of the strip-form wire engaging portion being provided with transverse serrations and an insulating support having an elongate wire supporting surface, the terminal and support being provided with cooperable mounting means whereby the terminal can be moved when mounted on the support from a first, wire receiving position in which the wire engaging surface is in spaced apart face-to-face relation to the wire supporting surface providing a wire admitting space therebetween to a second, wire connecting position, in which the wire engaging surface is forced with resilient flexure against a wire extending along the wire supporting surface so that the serrations penetrate the insulation of the wire to effect multiple connections along its length, the movement of the wire engaging surface from the first to the second position being substantially perpendicular to the wire, the mounting means comprising first and second arms extending transversely in the same direction from respective opposite ends of the wire engaging portion and arranged to grip sides of the support at locations adjacent opposite ends of the wire supporting surface in the first and second positions of the terminal.

4,572,604

PRINTED CIRCUIT BOARD FINGER CONNECTOR

J. Preston Ammon; Harry R. Weaver, both of Dallas, and Evan J. Evans, Plano, all of Tex., assignors to Elfab Corp., Lewisville, Tex.

Continuation-in-part of Ser. No. 411,516, Aug. 25, 1982, abandoned. This application Sep. 10, 1984, Ser. No. 649,026
Int. Cl.[4] H01R *9/09*
U.S. Cl. 339—176 MP **5 Claims**



1. An improved electrical connector for a printed circuit board of the type having conductive circuitry areas formed thereon and terminating along one edge thereof in a transversely extending spaced relationship and wherein an insulating housing containing elongated contacts is secured to the edge of said printed circuit board for affording electrical inter-

connection between said conductive circuitry and mating connector member, characterized by

elongated contact members, each elongated contact member including a first contact region adapted for positioning in facing engagement with said conductive circuitry of said printed circuit board and a second contact region adapted for positioning in facing engagement with said mating connector member;

the insulating housing being generally Y-shaped and having contact receiving sleeves formed therethrough, said insulating housing having an upper slotted head portion for receiving the edge of a printed circuit board and a lower blade portion for engaging a mating connector member, said slotted head portion including opposed walls having a plurality of inwardly facing recesses provided in parallel transversely spaced relationship therein and forming an upper portion of said sleeves, each of said recesses receiving one of said contact members with said first region positioned for inwardly facing engagement with one of the conductive areas on the edge of a printed circuit board inserted into the slot of the head portion; and

said lower blade portion of said insulating housing having a plurality of outwardly facing recesses formed in generally parallel spaced relationship, each of said recesses forming a lower portion of said sleeve and receiving one of said elongated contacts with said second contact region adapted for outwardly facing engagement with said mating member, and each end of said lower blade portion having a recess half the size of one of said outwardly facing recesses so that two or more connectors when placed end to end from a full recess between two adjoining connectors.

4,572,605

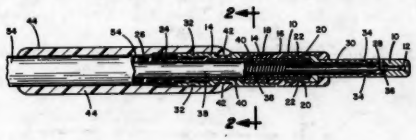
INJECTION MOLDED IN-LINE CONNECTOR ASSEMBLY FOR BIPOLAR LEADS

Douglas N. Hess, Maple Grove, Minn., assignor to Medtronic, Inc., Minneapolis, Minn.

Filed Aug. 9, 1984, Ser. No. 639,073

Int. Cl.⁴ H01R *17/18*

U.S. Cl. 339—177 R **4 Claims**



1. An in-line connector assembly for use in a pacing lead of the type having an inner conductor coil, an inner insulative sheath surrounding said inner conductor coil, an outer conductor coil surrounding said inner insulative sheath, and an outer insulative sheath surrounding said outer conductor coil, comprising:

a connector ring of conductive metal, having a longitudinal lumen open to the proximal and distal ends of said connector ring, said connector ring coupled to said outer conductor coil;

a connector pin having a longitudinal lumen open to the proximal and distal ends of said connector pin, said connector pin coupled to said inner conductor coil;

an insulating sleeve, molded to the proximal end of the lumen of said connector ring and to the exterior of the distal end of said connector pin; and

wherein the lumen of said connector ring is provided with means for preventing longitudinal and rotational movement of said insulating sleeve relative to said connector ring and wherein said insulating sleeve has a lumen connecting the lumen of said connector ring to the lumen of said connector pin and wherein the diameter of the lumens of said connector ring, connector pin and insulating sleeve are greater than the diameter of said inner insulative sheath, and wherein said connector ring is provided with at least one bore open to the lumen of said connector ring whereby said connector assembly may be backfilled with adhesive through said bore of said connector ring, frictionally attaching said connector ring, insulating sleeve and connector pin to said inner insulative sheath.

4,572,606

PROCESS FOR PRODUCING CONTACT-SPRING BUSHES AND A SPRING CONTACT BUSH

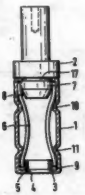
Bernhard Neumann, Waldkraiburg, and Rainer Ramisch, Mühldorf, both of Fed. Rep. of Germany, assignors to Otto Dunkel GmbH Fabrik für Elektrotechnische Gerate, Mühldorf, Fed. Rep. of Germany

Filed Nov. 23, 1984, Ser. No. 674,138

Claims priority, application Fed. Rep. of Germany, Nov. 25, 1983, 3342742

Int. Cl.⁴ H01R *11/22, 43/04*

U.S. Cl. 339—262 R **14 Claims**



1. A process for producing contact-spring bushes comprising:

(a) providing a substantially cylindrical, thin-walled, deformable bush body having spaced first and second end portions, said first end portion being partially closed by an inwardly extending annular flange portion which substantially centrally defines a contact-pin insertion orifice;

(b) providing an annular body internally of said bush body on said inwardly extending flange portion, said annular body having an outside diameter smaller than the inside diameter of said bush body to define an annular gap therebetween, and an inside diameter smaller than said contact-pin insertion orifice;

(c) positioning a plurality of aligned straight contact springs into said bush body, said springs having first and second ends, said first ends being positioned in said annular gap;

(d) partially inserting an annular extension of a line connection member into said second end portion of said bush body so as to fix said second ends of said contact springs between the inside surface of said second end portion of said bush body and the outside surface of said annular extension, with said first ends of said contact springs freely movable in said annular gap; and

(e) deformingly pressing said bush body from the outside to define at least two annular beads projecting radially inwards, said beads being spaced axially from each other and spaced axially from said first and second end portions of said bush body and engaging said contact springs to provide them with a radially inwardly curved configuration intermediate their first and second ends.

9. A contact-spring bush comprising:

a line connection piece with an annular projecting head;

an approximately cylindrical bush body formed by a thin-walled deformable sleeve having at one end an opening formed to receive the line connection piece inside the sleeve and grip it, having at its other end an entry port for a pin, and the sleeve having at least two intermediate regions spaced apart along the length of the bush of reduced internal diameter compared to its internal diameter at its ends;

an annular wall inside the bush body adjacent the entry port

for the pin and having an external diameter greater than that of the entry port; and

a plurality of contact springs, each having one end jammed between the head and the sleeve and the other end located in the annular gap between the annular wall and the sleeve, with the springs being bowed elastically inwards towards the central axis of the sleeve by contact with the two intermediate regions of reduced diameter.

4,572,607

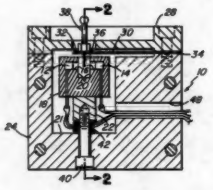
DISPLACEMENT TRANSDUCER USING A MOVABLE LIGHT SHIELD MOVED WITHIN A PREDETERMINED RANGE FOR LINEAR DETECTOR OUTPUT

Jan G. Krizik, Wellesley, Mass., assignor to IDR Enterprises, Inc., Wellesley, Mass.

Continuation of Ser. No. 345,395, Feb. 3, 1982, abandoned, which is a continuation of Ser. No. 59,259, Jul. 20, 1979, abandoned. This application Apr. 19, 1984, Ser. No. 604,209

Int. Cl.[4] G01B *11/16*; H01J *5/02*

U.S. Cl. 356—32 **9 Claims**



1. The method of measuring displacement of a member comprising:

providing a light-emitting diode and phototransistor so arranged that light emitted from said light-emitting diode is incident on said phototransistor and causes an output from said phototransistor, said phototransistor having a central region in which said output of said phototransistor is linearly related to the fraction of relatively narrow central region on which said light emitted from said diode is incident, said central region constituting a relatively narrow portion of the total range of operation of said phototransistor;

providing a movable shield intermediate said light-emitting diode and phototransistor in position for blocking a portion of said light emitted from said light-emitting diode and preventing said emitted light from being incident on a portion of said phototransistor;

connecting said shield to said member so that displacement of said member will move said shield and thus vary the amount of said emitted light blocked by said shield and the portion of said phototransistor on which said emitted light is incident, thereby changing said output from said phototransistor;

adjusting said shield relative to said light-emitting diode and phototransistor such that in an initial relative position thereof the portion of said phototransistor on which light emitted from said diode is incident includes some but not all of said relatively narrow central region of said phototransistor,

said shield thus being positioned relative to said light-emitting diode and said phototransistor such that movement of said shield in response to said displacement of said member will vary the fraction of said central region on which said emitted light is incident; and,

measuring said changes in said output of said phototransistor in response to movement of said member over the limited range in which such movement moves said shield so as to vary the fraction of said central region on which said light emitted from said diode is incident and in which changes in said output of said phototransistor per unit movement of said shield are substantially constant, thereby to determine the amount of displacement of said member.

4,572,608

OPTICAL DE-POLARIZER

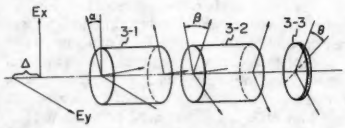
Kiyofumi Mochizuki, Tokyo, and Yoshinori Namihira, Kanagawa, both of Japan, assignors to Kokusai Denshin Denwa Co., Ltd., Tokyo, Japan

Filed Feb. 10, 1984, Ser. No. 578,832

Claims priority, application Japan, Feb. 24, 1983, 58-28560

Int. Cl.[4] G02B *6/26, 6/42*

U.S. Cl. 350—96.15 **2 Claims**



1. An optical de-polarizer for providing de-polarized optical beam comprising;

a first optical fiber,

a second optical fiber coupled with output of said first optical fiber,

wherein $|t_1-t_2|>t_c$ is satisfied where t_1 is polarization made dispersion in said first optical fiber, t_2 is polarization made dispersion in said second optical fiber, t_c is coherence time of an optical beam, and an angle between polarization axis of said first optical fiber and polarization axis of said second optical fiber is approximately 45°.

4,572,609

COOLING MECHANISM FOR OPTICAL FIBER

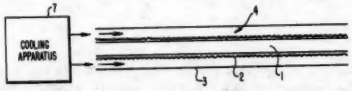
Shiro Sakuragi; Mitsunori Saitoh, both of Kyoto; Haruo Kotani, Osaka, and Kyoshiro Imagawa, Kyoto, all of Japan, assignors to Agency of Industrial Science & Technology, Tokyo, Japan

Continuation of Ser. No. 396,472, Jul. 8, 1982, abandoned. This application Dec. 7, 1984, Ser. No. 679,105

Claims priority, application Japan, Jul. 10, 1981, 56-107139

Int. Cl.[4] G02B *5/172*

U.S. Cl. 350—96.30 **8 Claims**



1. A mechanism for cooling optical fibers, comprising:

at least one infrared light transmitting optical fiber;

metal netting wound about said at least one fiber to conduct heat from said at least one fiber; and

a sheath, said at least one fiber on the periphery thereof and said netting being inserted in said sheath, said sheath and said netting being spaced so as to permit cooling air to flow therebetween to cool said at least one fiber.

4,572,610

OPTICAL FIBER BUFFER COATED WITH HALOGENATED DIHYDROXY-TERMINATED POLYBUTADIENES

John J. Krajewski, Wheeling, Ill., assignor to DeSoto, Inc., Des Plaines, Ill.

Filed May 21, 1984, Ser. No. 612,426

Int. Cl.[4] G02B *5/16*

U.S. Cl. 350—96.34 **9 Claims**

1. An optical glass fiber buffer coated with an ultraviolet-cured coating of a coating composition consisting essentially of

a radiation-curable diethylenically unsaturated polyurethane resin which cures to provide cured coatings which are solid, nonflowable and cross-linked at room temperature, have a low tensile modulus at low service temperature, and have a high index of refraction above 1.48, constituted by the diethylenic diurethane reaction product of an essentially saturated, halogenated, dihydroxy-terminated linear liquid polybutadiene polymer, an organic diisocyanate, and a monoethylenically unsaturated monomer carrying a single hydroxy group, less than 40% of a liquid solvent therefor, and a photoinitiator enabling said composition to cure on ultraviolet light exposure.

4,572,611

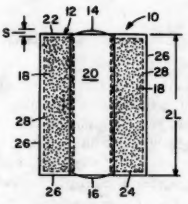
APPARATUS INCLUDING AN INTEGRAL OPTICAL DEVICE

Robert H. Bellman, Catlin; Nicholas F. Borrelli, Elmira; David L. Morse, and Paul A. Sachenik, both of Corning, all of N.Y., assignors to Corning Glass Works, Corning, N.Y.

Continuation-in-part of Ser. No. 520,456, Aug. 4, 1983, abandoned. This application Feb. 4, 1985, Ser. No. 697,957

Int. Cl.[4] G02B *1/00, 27/00;* **C03C** *23/00;* **B29C** *27/00*

U.S. Cl. 350—167 **41 Claims**



1. A method for focusing at least one image of an object on a receiving surface which comprises interposing an optical imaging device between the object and the surface to form an image of the object on the surface, said optical imaging device comprising a glass body at least a portion of which is a photonucleated opacified glass, said body having opposed surfaces, at least one of the surfaces having raised transparent light focusing optical pattern portions integral therewith, and transparent channels connecting said raised pattern portions to the surface opposed to the surface containing said pattern.

4,572,612

PHOTOGRAPHIC OBJECTIVE WITH A FASTENING DEVICE

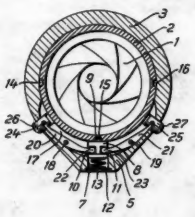
Werner Schlapp, Asslar, and Willi Wiessner, Wetzlar, both of Fed. Rep. of Germany, assignors to Ernst Leitz Wetzlar GmbH, Wetzlar, Fed. Rep. of Germany

Filed Sep. 30, 1983, Ser. No. 537,700

Claims priority, application Fed. Rep. of Germany, Oct. 2, 1982, 8227716[U]

Int. Cl.[4] G02B *7/02;* **G03B** *17/00*

U.S. Cl. 350—257 **6 Claims**



1. A photographic objective having a long focal length and being adapted for attachment to a supporting device, comprising:

a tubular structural part of the objective which carries at least one optical element and which has a plurality of recesses arranged radially on the external wall thereof;

an essentially annular holder which surrounds said tubular part, is stationary in the axial direction and is capable of rotating around said tubular part;

a fastening element mounted on said holder for attachment to the support device; and

means, mounted in the external wall of said holder, for locking the holder in said recesses, said recesses arranged in predetermined positions with respect to the circumference of said tubular part;

wherein said holder includes a portion at one side thereof which is enlarged in the direction perpendicular to the optical axis of the objective, said enlarged portion forming a widened support element having a face for application to said supporting device, and wherein the fastening element and the locking means are mounted on said support element.

4,572,613

METHOD AND APPARATUS FOR ILLUMINATING A SPOT INSIDE OF A TUNNEL OF A HIGHWAY

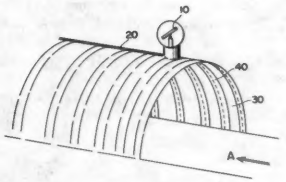
Kei Mori, 3-16-3-501, Kaminoge, Setagaya-ku, Tokyo, Japan

Filed Jun. 1, 1984, Ser. No. 616,360

Claims priority, application Japan, Jun. 6, 1983, 58-100518

Int. Cl.[4] G02B *17/00, 5/14*

U.S. Cl. 350—265 **8 Claims**



1. A method for illuminating the inside of a tunnel of a highway comprising the steps of collecting solar rays by focusing the solar rays utilizing a lens, guiding said collected solar rays along an optical conductor leading to an entrance portion of the inside of a tunnel, radiating light from said optical conductor to illuminate the inside of said entrance portion, varying the extent of the radiating light along the length of said entrance portion to provide gradual decreasing illumination from the entrance and extending into the tunnel such that a person's eyesight gradually adjusts to the darkness of the tunnel upon driving into said tunnel, the amount of illumination in said entrance portion being related to the brightness outside of the tunnel as determined by the collected solar rays.

4,572,614

CONDENSER HOUSING FOR MICROSCOPES

Robert Lisfeld, Greifenstein-Ulm, and Edwin Diehl, Waldsolms, both of Fed. Rep. of Germany, assignors to Ernst Leitz Wetzlar GmbH, Wetzlar, Fed. Rep. of Germany

Filed Mar. 12, 1984, Ser. No. 588,456

Claims priority, application Fed. Rep. of Germany, Mar. 21, 1983, 8308331[U]

Int. Cl.[4] G02B *7/00*

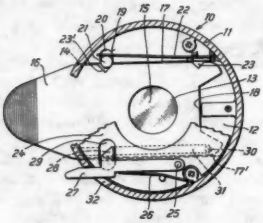
U.S. Cl. 350—315 **7 Claims**

1. A microscope housing having a slit for receiving a slide which has at least one indexing notch along one side thereof, comprising:

means connected to said housing and adjacent to said slit for guiding said slide upon insertion into said slit;

means connected to said housing and adjacent said slit for securing said slide in an indexing position by engaging an indexing notch provided on said slide; and

manually releasable means connected to said housing and adjacent said slit for moving between a first locking position for preventing said slide from being removed from said housing, and a second, manually released position for allowing said slide to be removed from said housing, wherein, when said releasable means are in said first position, said slide is arranged to move between an optically effective position and an optically ineffective position.



4,572,615

MULTIPLEXABLE METAL-INSULATOR-METAL LIQUID CRYSTAL CELL

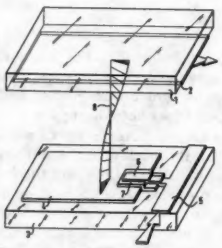
Friedrich W. Nickol, Eppstein, and Holm Baeger, Schwalbach, both of Fed. Rep. of Germany, assignors to VDO Adolf Schindling AG, Frankfurt am Main, Fed. Rep. of Germany

Filed Aug. 3, 1983, Ser. No. 520,063

Claims priority, application Fed. Rep. of Germany, Aug. 7, 1982, 3229584

Int. Cl.[4] G02F *1/133*; H01L *49/02*

U.S. Cl. 350—334 **19 Claims**



1. In a multiplexable liquid-crystal cell having two substrates which are spaced from each other and form between each other a cell space filled with liquid-crystal substance, the cell having strip electrodes arranged on one of the substrates on the side of the cell space and picture electrodes arranged opposite the strip electrodes side on the other substrate on the side of the cell space, the picture electrodes being connected via metal-insulator-metal elements with data lines, the latter being also arranged on said other substrate, the improvement comprising

a separate insulating layer disposed on each of said picture electrodes, each of said picture electrodes being located between said insulating layer and said other substrate, and

a connecting contact carried by said insulating layer and laying on a side of said insulating layer opposite said other substrate, said connecting contact leading to one of said data lines, and wherein

said picture electrode, in combination with said insulating layer and said connecting contact, forms a metal-insulator-metal connection.

4,572,616

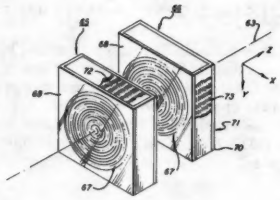
ADAPTIVE LIQUID CRYSTAL LENS

Stephen T. Kowel, Syracuse; Philipp G. Kornreich, No. Syracuse, and Dennis S. Cleverly, Utica, all of N.Y., assignors to Syracuse University, Syracuse, N.Y.

Filed Aug. 10, 1982, Ser. No. 406,871

Int. Cl.[4] G02F *1/133*

U.S. Cl. 350—335 **8 Claims**



1. An adaptive lens for focusing arbitrarily polarized light entering the system at an image plane that includes

a pair of liquid crystal cells which are placed in series along an axis defining the axis of the lens,

each of said cells having a pair of flat optically clear plates that are perpendicularly aligned with the lens axis, a liquid crystal housed between the plates and a series of radially disposed transparent control electrodes mounted upon one of the plates that are symmetrically positioned about the lens axis,

a first of said cells having means associated therewith for preferentially aligning the liquid crystal housed therein in an X-direction,

a second of said cells having means associated therewith for preferentially aligning the liquid crystal housed therein in a Y-direction,

said two liquid crystal cells being arranged to influence light passing therethrough only with nematic material contained therein, and

control means for selectively placing a predetermined voltage values on each of said control electrodes for contouring the index of refraction profile of the liquid crystal about the lens axis to obtain a spherical lens response for focusing arbitrarily polarized light at an image plane.

4,572,617

ELECTROOPTICAL DEVICE HAVING THINNER LIQUID CRYSTAL LAYER IN DISPLAY PORTIONS

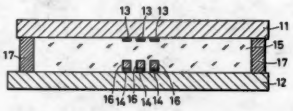
Yuichi Masaki, Kawasaki, and Makoto Ogura, Hiratsuka, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 15, 1983, Ser. No. 504,418

Claims priority, application Japan, Jun. 23, 1982, 57-107880; Jun. 25, 1982, 57-109367

Int. Cl.[4] G02F *1/13*

U.S. Cl. 350—339 R **14 Claims**



1. An electrooptical device having a dichroic dye-containing nematic liquid crystal layer between a pair of electrode plates,

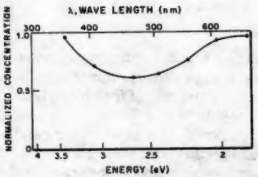
said liquid crystal having a positive dielectric anisotropy, which is characterized in that;

at least one of said pair of electrode plates has a surface of electrodes formed in a pattern, which is treated for homogeneous alignment, and another surface treated for homeotropic alignment on the electrode-less area of said electrode plate, and the thickness of the section of the liquid crystal layer laid between the display pattern of electrodes and the counter electrodes, wherein the liquid crystal is controlled selectively in either a colored state or a colorless or light-colored state by applying or not applying a voltage between the electrodes, is made thinner than the thickness of the other section of the liquid crystal layer, which is not interposed between the electrodes and corresponds to the background of the display pattern, by the thickness of a photo-cured photosensitive resin which is formed corresponding to said section of the liquid crystal layer laid between the display pattern of electrodes and the counter electrodes.

4,572,618
METHOD FOR THE PREPARATION OF PHOTOCHROMIC INSULATING CRYSTALS

Marvin M. Abraham, Oak Ridge, Tenn.; Jose L. Boldu, Mexico City, Mexico; Yok Chen, Oak Ridge, Tenn., and Victor M. Orera, Zaragosa, Spain, assignors to The United States of America as represented by the Department of Energy, Washington, D.C.

Filed Sep. 28, 1984, Ser. No. 655,592
Int. Cl.⁴ G02B *5/23*; C04B *35/00*
U.S. Cl. 350—354 **11 Claims**



1. Photochromic magnesium oxide crystal containing about 0.1 to about 0.01 weight percent, based on the amount of magnesium oxide, of lithium and about 0.05 to about 0.0005 weight percent, based on the amount of magnesium oxide, of nickel.

4,572,619
ELECTRICALLY DIMMABLE REAR-VIEW MIRROR FOR MOTOR VEHICLES

Siegfried Reininger, Deizisau, and Albert Wiesmeier, Esslingen, both of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany

Filed Jan. 26, 1984, Ser. No. 574,084
Claims priority, application Fed. Rep. of Germany, Jan. 27, 1983, 3302630
Int. Cl.⁴ G02F *1/055*; G02B *5/08*
U.S. Cl. 350—392 **13 Claims**

1. An electrically dimmable rear-view mirror comprising:

a linear polarizing means with a transmission axis receiving incident light for generating a light output,

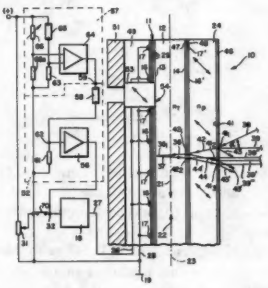
a transmission layer means for receiving at least a portion of light output from the linear polarizing means to transmit a portion of the light received thereby and including a ceramic means exhibiting an electro-optical effect in response to an electric field for controlling the effective reflectivity of the rear-view mirror,

a reflecting layer means including at least a multi-layer dielectric arrangement receiving light output from the transmission layer means,

spaced electrode means disposed on at least one side of the transmission layer means for generating an electric field substantially parallel to the transmission layer means in response to a voltage applied to the electrode means to provide a linear birefringence in the transmission layer,

a transmission window means in the reflecting layer means for transmitting a luminous flux from the transmission layer,

a second polarizer for receiving said transmitted luminous flux, the transmission axis of the second polarizer coinciding with that of the linear polarizer,



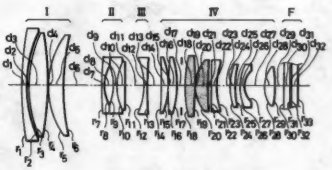
a light sensor means receiving the transmitted luminous flux from the second polarizer for generating a voltage output signal which increases monotonically with the intensity of the transmitted luminous flux from the second polarizer,

a control voltage source responsive to the voltage output signal to produce a voltage which, in its turn, increases monotonically with the output voltage from the light sensor means for generating the electric field which effects the linear birefringence of the transmission layer.

4,572,620
ZOOM LENS SYSTEM

Juro Kikuchi, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Aug. 10, 1983, Ser. No. 521,821
Claims priority, application Japan, Aug. 16, 1982, 57-141095
Int. Cl.⁴ G02B *15/00*
U.S. Cl. 350—427 **16 Claims**

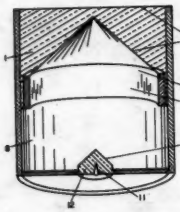


1. A zoom lens system comprising a first lens group having positive refractive power, a second lens group having negative refractive power, a third lens group having negative refractive power, and a fourth lens group having positive refractive power, said fourth lens group consisting of a front sub-group consisting of two positive lenses, a middle sub-group consisting of two positive lenses and a negative lens, and a rear sub-group consisting of a negative lens and two positive lenses, said zoom lens system being arranged to be zoomed by moving said second and third lens groups, at least one element in said fourth lens group being arranged as a plastic lens with at least one lens surface being arranged as an aspherical surface.

4,572,621
CONICAL BEAM CONCENTRATOR

John E. Clegg, 2320 Keystone Dr., Orlando, Fla. 32806

Filed Sep. 17, 1984, Ser. No. 651,365
Int. Cl.[4] G02B *13/18, 17/08*
U.S. Cl. 350—432 1 Claim



1. A conical beam concentrator comprising two component lenses (1,12) and a cylindrical mirror (7) which receive an incipient whole beam (3) and emit a concentrated whole beam (13), comprising:

a. Upper component lens RT (1) with planar section (2) which receives and transmits incipient whole beam (3), and with a concave conical section (4) which refracts beam (3), forming divergent conical beam (5),

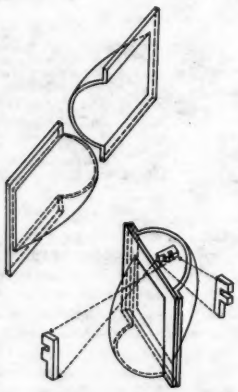
b. Concave cylindrical mirror (7) mounted below upper component lens RT (1), with an inner reflective wall (6) which reflects beam (5) inward, forming convergent conical beam (9), and

c. Lower component lens RT (12) mounted below concave cylindrical mirror (7), with a convex conical section (10) which transmits beam (9), and with a concve conical section (11) which refracts beam (9), forming concentrated whole beam (13) which is emitted parallel to the vertical axis of the lenses.

4,572,622
DIRECT OPPOSITE REVERSE REFRACTOR

David Sterner, 117 NE. 12th #1, Portland, Oreg. 97232

Continuation of Ser. No. 415,579, Sep. 7, 1982. This application Jul. 30, 1984, Ser. No. 636,074
Int. Cl.[4] G02B *3/02*
U.S. Cl. 350—432 4 Claims



1. A lens structure capable of casting an upright and unreversed image, comprising:

a. an arcuately-shaped bubble of transparent material having a rectangularly-bordered base, wherein:

1. said bubble is severed equilaterally, forming two directly opposing halves;

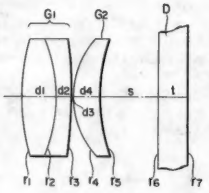
2. said halves being placed in a back-to-back and reversed position with respect to each other, and being rejoined to form a skewed-barrel-shaped lens structure having an opening at each end; and

3. one of said openings at said ends being sealed and said lens structure then being filled with a refractive liquid material, such that the surface of said refractive liquid material forms a flat reflective surface.

4,572,623
OBJECTIVE LENS FOR OPTICAL DISC

Masashi Tanaka, Kawasaki, and Hiroshi Ohki, Tokyo, both of Japan, assignors to Nippon Kogaku K.K., Tokyo, Japan

Filed Mar. 19, 1984, Ser. No. 590,773
Claims priority, application Japan, Mar. 24, 1983, 57-49493
Int. Cl.[4] G02B *9/06, 21/02*
U.S. Cl. 350—480 6 Claims



1. An objective lens for detecting information recorded on an optical disc at high density, comprising, in succession from farther conjugate point side of the objective lens toward nearer conjugate point side,

first lens composed of a positive lens and a negative lens cemented together and having a positive total refractive power, and second lens of a positive meniscus lens whose concave surface faces toward the nearer conjugate point side, and further satisfying the conditions;

$$1.1 < \frac{r_3 + r_2}{r_3 - r_2} < 2.0$$

$$2.1 < \frac{r_5 + r_4}{r_5 - r_4} < 3.5$$

wherein r_2, r_3 show the radii of curvature of the cemented surface of the first lens and of the surface of the nearer conjugate point side, respectively and r_4, r_5 show the radii of curvature of the surface of the second lens at the farther conjugate point side and of the surface at the nearer conjugate point side, respectively.

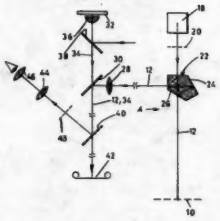
4,572,624
DRAFTING AND MACROPHOTOGRAPHY ATTACHMENT FOR A MICROSCOPE OF THE INVERTED TYPE

Klaus Schindl, Vienna, Austria, assignor to C. Reichert Optische Werke, AG, Vienna, Austria

Filed Jul. 6, 1983, Ser. No. 511,435
Claims priority, application Fed. Rep. of Germany, Jul. 7, 1982, 3225353
Int. Cl.[4] G02B *21/36, 27/10*
U.S. Cl. 350—502 7 Claims

1. Drafting macrophotography attachment, for a microscope of the inverted type having an objective and a deflecting device which deflects a downward-directed microscope object

beam laterally and upwardly to an eyepiece, thereby permitting an image to be viewed, comprising a removably mounted surface for reflecting images disposed between the microscope objective and the deflecting device, said surface reflecting a drawing surface or a macro-object into the microscope object beam, by means of a first deflecting means which laterally deflects an upwardly-directed beam from a horizontal drawing surface, or from a horizontally lying macro-object, in a plane which is parallel with the plane in which the microscope object beam is deflected; a second deflecting means which further deflects the beam downwards to a third deflecting means, the



third deflect means further deflecting the beam at a right angle to the beam between the first and second deflecting means and toward the surface for reflecting images, on of the three deflecting means possessing two reflecting surfaces which produce an inversion of the image, and each of the other two deflecting means possessing a single reflecting surface, or an odd number of reflecting surfaces, means being disposed between the first and second deflecting means to form a single intermediate image of the macro-object, or drawing surface, said intermediate image being formed between the second and third deflecting means.

4,572,625

OPTICAL SYSTEM FOR A SIGHTING DEVICE

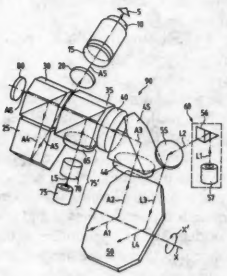
Klaus Arndt, Mägenwil, and Saverio Sanvido, Glattbrugg, both of Switzerland, assignors to Contraves AG, Zürich, Switzerland

Filed May 2, 1984, Ser. No. 606,399

Claims priority, application Switzerland, May 17, 1983, 2677/83

Int. Cl.⁴ G02B *23/04, 23/08*

U.S. Cl. 350—541 **14 Claims**



1. An optical system for a periscope-like sighting device for localizing, tracking and measuring a target, comprising:

a laser range-finder comprising a transmitter portion and a receiver portion respectively transmitting and receiving a beam of invisible radiation;

said laser receiver portion of said laser range-finder having principal optical components integrated into the optical system;

the optical system comprising:

a main mirror containing a reflecting surface receiving and reflecting said beam of invisible radiation transmitted by said transmitter portion of said laser range finder and also receiving and reflecting a beam of visible radiation containing an image of said target;

said main mirror being rotatable about a first axis and pivotable about a second axis;

said main mirror receiving and reflecting said beams of visible and invisible radiation which are substantially parallelly incident upon said reflecting surface of said main mirror;

a first deflection prism following said main mirror and deflecting said beams of visible and invisible radiation reflected by said main mirror toward said first deflection prism;

an objective lens system;

a first beam-splitter;

said objective lens system being arranged between said first deflection prism and said first beam-splitter and conducting said beams of visible and invisible radiation deflected by said first deflection prism to said first beam-splitter;

said first beam-splitter splitting said beams of visible and invisible radiation received from said objective lens system into a beam of visible radiation and a beam of invisible radiation;

said first beam-splitter directing said beam of invisible radiation to said laser receiver portion of said laser range finder;

a second beam-splitter following said first beam-splitter and receiving said beam of visible radiation from said first beam-splitter;

an ocular; and

said second beam-splitter splitting said beam of visible radiation received from said first beam-splitter into a visual observation beam directed toward said ocular and a tracking beam.

4,572,626

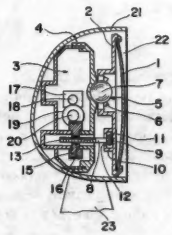
ELECTRIC REMOTE CONTROL BACK-MIRROR ASSEMBLY

Masaru Suzuki, Chiryu, Japan, assignor to Kabushiki Kaisha Tokai Rika Denki Seisakusho, Japan

Filed Dec. 5, 1983, Ser. No. 558,177

Int. Cl.⁴ G02B *7/18*

U.S. Cl. 350—634 **5 Claims**



1. An electric remote control back-mirror assembly which comprises, in combination:

a mirror unit including a mirror holder and a mirror supported by the mirror holder;

a spherical mounting member for clamping the mirror holder thereon for pivotal movement around horizontal and vertical axes;

a support member for carrying the spherical mounting member;

a pair of sockets provided on the mirror holder in spaced relation to the spherical mounting member and spaced a

predetermined angle from each other with respect to the spherical mounting member;

a pair of rod members mounted at one end in the respective sockets against rotational and axial displacement relative to the mirror holder, said rod members protruding from the mirror holder;

a pair of drive members rotatably supported by said support member in driving engagement with respective end portions of the rod members; and

an electric drive means for selectively rotating the drive members to pivotally adjust the mirror unit about the spherical mounting member to adjust the angularity of the mirror unit with respect to the horizontal and vertical axes,

each of said rod members being capable of movement relative to the mirror holder along a line to be connected between the spherical mounting member and the respective socket.

4,572,627

EYE FUNDUS CAMERA

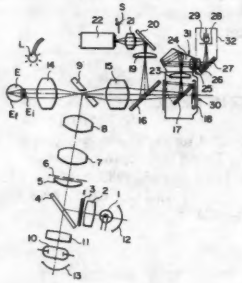
Haruhisa Madate, Kawasaki; Isao Matsumura, Yokosuka, and Kyoji Sekiguchi, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 15, 1982, Ser. No. 441,785

Claims priority, application Japan, Nov. 21, 1981, 56-187618; Nov. 21, 1981, 56-187619

Int. Cl.⁴ A61B *3/14*

U.S. Cl. 351—206 **15 Claims**



1. An eye fundus camera comprising:

a photographing system having a photo-taking light path for taking a picture of the fundus of an eye to be examined;

a fundus illumination system for providing visible light and invisible light to illuminate said eye fundus;

light dividing means fixedly disposed in said photo-taking light path for at least partially separating visible light and invisible light from each other by transmission and reflection;

image receiving means optically associated with said photographing system through said light dividing means for receiving a visible light image of said eye fundus;

invisible-light-responsive image pick-up means optically associated with said photographing system through said light dividing means to pick up an image of the eye fundus and produce an electrical signal; and

means disposed relative to said image pick-up means for preventing the incidence of both said visible light and said invisible light, provided by said fundus illumination system, onto said image pick-up means from said light dividing means for a determined time period.

4,572,628

METHOD OF AND APPARATUS FOR MEASURING RADIUS

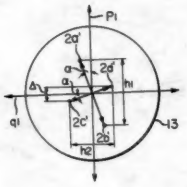
Masao Nohda, Yokosuka, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan

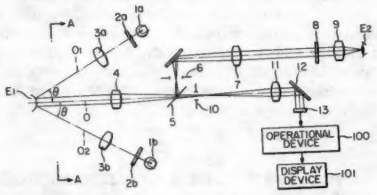
Filed May 18, 1982, Ser. No. 379,552

Claims priority, application Japan, May 29, 1981, 56-82023; May 29, 1981, 56-82024

Int. Cl.⁴ A61B *3/10*

U.S. Cl. 351—212 **6 Claims**





1. An automatic apparatus for measuring radius of curvature, including:

(a) measuring optical means having an objective lens;

(b) first projection optical means for projecting a first pair of light spots onto an object to be examined from two respective directions symmetric with respect to the optical axis of said objective lens;

(c) second projection optical means for projecting a second pair of light spots onto said object from two respective directions symmetric with respect to the optical axis of said objective lens and discrete from the spots and directions of said first projection optical system;

(d) light image position detecting means for receiving through said objective lens reflected light from said four light spots reflected by said object, said detecting means being disposed at a predetermined position on the optical axis of said measuring optical means and in a plane orthogonal to said optical axis and producing signals corresponding to the positions thereon of images of the light spots formed by said objective lens; and

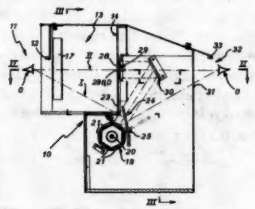
(e) operation and display means for obtaining from said signals at least three, and no more than four, of the spacings between the images of the light spots of said first pair and between the images of the light spots of said second pair along two predetermined directions different from each other which lie in said plane, and for determining, based on said spacings, and displaying an angle which determines the directions of the principal meridians of said object and the radii of curvature in those directions.

4,572,629

APPARATUS FOR PRESENTATION OF EYE TESTS FOR TESTING NEAR AND DISTANT VISION

Luc Tagnon, Saint-Mande, France, assignor to Essilor International Cie Generale d'Optique, Paris, France

Filed Nov. 12, 1982, Ser. No. 441,248
Claims priority, application France, Nov. 13, 1981, 81 21231
Int. Cl.[4] A61B *3/02*
U.S. Cl. 351—243 **16 Claims**



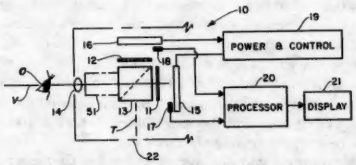
1. Apparatus for displaying eyesight test objects for patients, said apparatus comprising a viewing station for the patient, a test support having a plurality of eyesight test objects, said eyesight test objects being selectively positionable at a single display station, a single selected one of said eyesight test objects positioned at said single display station being visible from the viewing station along each of first and second optical paths, said first optical path being for near vision testing and being devoid of optical focusing means and said second optical path being for far vision testing and having optical focusing means.

4,572,630

VARIABLE CONTRAST DIRECT READ-OUT VISION TESTER

Harry L. Task, Dayton, Ohio and Louis V. Genco, Enon, San Antonio, Tex., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Mar. 1, 1984, Ser. No. 585,092
Int. Cl.[4] A61B *3/02*
U.S. Cl. 351—243 **15 Claims**



1. A system for testing visual sensitivity of a subject to contrast, comprising:

a. first and second translucent displays disposed for viewing along respective first and second optical axes, said displays having respective test and reference patterns thereon of first optical transmissivity on a background of second optical transmissivity;

b. first and second light means disposed, respectively, near said first and second displays for transilluminating said displays;

c. optical means for superimposing the images of said transilluminated displays for viewing by said subject along one of said axes;

d. means for controlling the respective light intensities of said first and second light means;

e. first and second light sensors disposed, respectively, near said first and second light means for measuring the light intensities of said light means and providing an output signal characteristic thereof; and

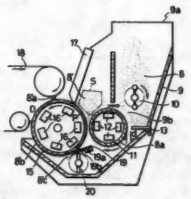
f. means for comparing the output signals of said light sensors to provide a measure of the relative contrasts of the transilluminated images of said first and second displays.

4,572,631

DOUBLE SLEEVE DEVELOPING DEVICE

Shiroh Kondo, Sagamihara, Japan, assignor to Ricoh Company, Ltd., Japan

Filed Mar. 22, 1984, Ser. No. 592,287
Claims priority, application Japan, Mar. 22, 1983, 58-46067; Sep. 27, 1983, 58-178675
Int. Cl.[4] G03G *15/08*
U.S. Cl. 355—3 DD **17 Claims**



1. A developing device for developing a latent image on an image carrier at a developing region, comprising:

storing means for storing a developing agent; first

transporting means for transporting said developing agent as carried thereon along a first predetermined path when supplied from said storing means;

second transporting means disposed adjacent to said first transporting means substantially horizontally for transporting said developing agent as carried thereon along a second predetermined path by receiving said developing agent from said first transporting means at least partly, said second predetermined path extending through said developing region;

first regulating means for regulating the amount of said developing agent to be supplied to said developing region as carried on said second transporting means, said first regulating means being disposed above and in contact with said second transporting means thereby defining a stagnating region, together with said first and second transporting means, where said developing agent stagnates at least partly; and

scraping means for scraping off said developing agent remaining on said second transporting means after passing through said developing region.

4,572,632

COMPOSITE APPARATUS FOR THE DIRECT PROJECTION AND OVERHEAD OR BACKPROJECTION OF SLIDES

Jacques Bodier, Claye-Souilly; Pierre Cochard, Cerisiers; Christian Merlier, Livry-Gargan, and Edouard P. Bouquin, Domont, all of France, assignors to Societe Anonyme dite: PRESTINOX, Villepinte, France

Filed Sep. 25, 1984, Ser. No. 654,115
Claims priority, application France, Sep. 30, 1983, 83 15588
Int. Cl.[4] G03B *21/30*
U.S. Cl. 353—71 **7 Claims**

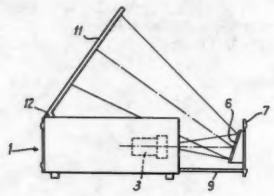
1. Composite apparatus for direct projection and overhead projection of slides comprising:

(a) a box which defines a particular boundary when in a closed position and includes a source of light and a projection lens having a particular focal distance;

(b) an overhead screen hingedly mounted on an upper face of said box, about a first horizontal, transverse pin;

(c) a mirror for reflecting a light beam issuing from said lens toward said overhead screen;

(d) means for moving said mirror between a first direct viewing position inside said boundary and out of a path of said light beam issuing from said lens to allow said light beam to pass towards a remotely located screen, and a second overhead viewing position outside said boundary wherein said mirror is interposed in front of said lens in



the path of said light beam to reflect said beam towards said overhead screen, and longitudinally displaced from said box at a distance from said lens which is a function of said focal distance of said lens; and

wherein said overhead screen being adapted to have a first position wherein said screen lies flat and substantially parallel to a top surface of said box, and a second position outside said boundary wherein said overhead screen is opened in a position inclined upwardly and forwardly to receive said light beam reflected upwardly and rearwardly by said mirror.

4,572,633

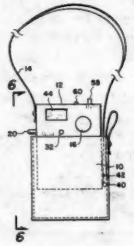
ONE-SHOT EXPANDABLE CAMERA

Thomas E. Burke, 13330 E. 33rd Pl., Tulsa, Okla. 74134

Filed Oct. 17, 1984, Ser. No. 661,592

Int. Cl.[4] G03B *17/38, 29/00*

U.S. Cl. 354—82 **5 Claims**



1. A light weight, portable camera having a substantially rectangular shape, a case of substantially rectangular shape, the case being hollow and having an internal rectangular recess slightly larger than the camera so as to hold the camera closely therein, an elongated strap connected at one end thereof to the outside of the camera and connected at an opposite end to the outside of the case, a strap engaging means on the outside of said camera, means on said strap spaced from said opposite end thereof for mating with said strap engaging means and for forming a shorter closed strap loop between the camera and the case and a longer closed strap loop between said strap engaging means and said one end of said strap, whereby, when the camera is inserted into the case the shorter strap loop is positioned in folded condition between the outside of the camera and the inside of the case to hold the camera and case snuggly together, the longer strap loop providing a means for supporting the camera and case around the neck of a person, a lens in said camera, a shutter in said camera in alignment with said lens and adapted to be tripped and to expose a film in said camera from light passing into said camera through said lens upon the tripping of said shutter, a releasable and resettable shutter tripping mechanism mounted within said camera, a spring mounted switch having an outer end extending outwardly through an opening in said camera and resiliently engaging the inside of said case when said camera is positioned within said case, said switch having an inner end engagable with said shutter tripping mechanism when the latter has been reset and when the outer end of said switch is resiliently engaging the inside of said case, whereby, when the case is pulled away from said camera, the case will first fully expose said lens and said switch will thereafter pass out of contact with the inside of the case to release said shutter tripping mechanism to trip said shutter and take a picture.

4,572,634

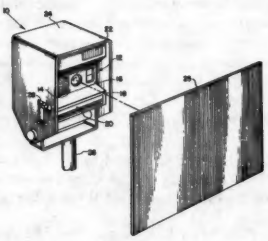
METHOD OF AND SYSTEM FOR IDENTIFYING SUBJECTS

James J. Livingston, Waltham, and Duncan C. Sorli, Chelmsford, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Dec. 7, 1984, Ser. No. 679,254

Int. Cl.[4] G03B *17/50;* **G03D** *9/00*

U.S. Cl. 354—84 **5 Claims**



1. An economical method of preparing hard copy identification documents each containing a composite of a photograph of a subject being identified and related alphanumeric information comprising the steps of:

exposing each subject that is to be identified separately on an individual film unit at a plurality of field stations to obtain a positive print thereof, whereby the quality of the subject's image can be ascertained before forwarding to a central processing station;

transmitting said positive prints of the subjects to a central processing station along with appropriate alphanumeric information relating to each of the subjects;

exposing individual ones of said positive prints simultaneously with their respective said alphanumeric information at the central processing station on successive sections of an elongated strip of diffusion transfer film;

automatically advancing the exposed strip along a first path to a processing station at the central station and advancing a second sheet along a second path to the processing station;

superimposing the advancing strips by pressure-applying members to disperse fluid between the advancing strips to initiate imbibition of the exposed strip;

advancing the superposed strips along an imbibition path so that visible images are formed on one of the strips; and,

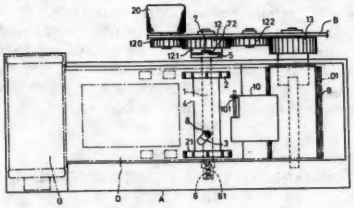
drying the strip containing the images thereby facilitating laminating and cutting of the strip to form an individual identification document for each of said subjects.

4,572,635

AUTOMATIC FILM LOADING SYSTEM

Yu Tsuzuki, Hirakata; Hiroshi Watanabe, Suita, and Katsuhisa Niwa, Osaka, all of Japan, assignors to West Electric Company, Ltd., Osaka, Japan

Filed Jun. 5, 1984, Ser. No. 617,477
Claims priority, application Japan, Jun. 6, 1983, 58-101142
Int. Cl.[4] G03B *1/12*
U.S. Cl. 354—173.1 4 Claims



1. An automatic film loading system comprising:
motor means for feeding driving power for winding up a film,
a film spool having catching means for catching a starting end tip of said film,
a sprocket having sprocket gears each with teeth for engaging perforations of the film,
first transmission means comprising gear means energized by said motor means, for transmitting rotary motion corresponding to a selected film advancing speed, to said film spool,
second transmission means comprising gear means energized by said motor means, for transmitting another rotary motion to said sprocket gears to rotate said sprocket at a speed corresponding to a film advancing speed that is lower than said selected film advancing speed, and
transmission control means comprising a transmission/non-transmission means movable from a first position wherein said sprocket is connected to said second transmission means to a second position wherein said sprocket is disconnected from said second transmission means, said control means including means operable to effect movement of said transmission/non-transmission means from said first to said second position upon said sprocket being rotated at a peripheral speed corresponding substantially to said selected film advancing speed.

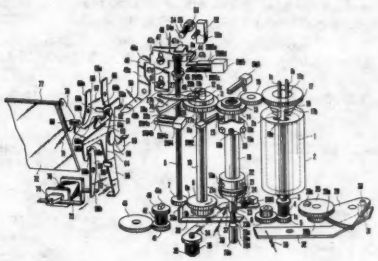
4,572,636

MOTORIZED WINDING AND REWINDING CAMERA

Tatsuo Konno, Kanagawa, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 3, 1984, Ser. No. 576,859
Claims priority, application Japan, Feb. 5, 1983, 58-17767
Int. Cl.[4] G03B *1/24*
U.S. Cl. 354—173.11 7 Claims

7. A motorized winding and rewinding camera comprising:
(a) a winding system having driving torque transmitting means for winding up a film including a film advance control wheel;
(b) a rewinding system having a driving torque transmitting means for rewinding the film;
(c) an electric motor operable as a driving torque source for said winding system and said rewinding system;
(d) first film motion detecting means for detecting rotation of said film advance control wheel while rewinding the film, said wheel being positioned in said driving torque transmitting means of said winding system and being arranged upon operation of said rewinding system to be freed from the tranmission from said motor; and



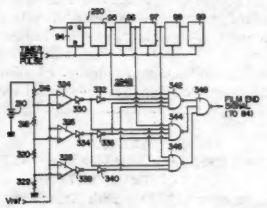
(e) second film motion detecting means for detecting motion of the film while the film is being wound.

4,572,637

FILM END DETECTOR FOR USE IN CAMERAS

Akira Inoue, Hachioji, Japan, assignor to Olympus Optical, Co., Ltd., Tokyo, Japan

Filed Jan. 9, 1984, Ser. No. 569,149
Claims priority, application Japan, Feb. 28, 1983, 58-32036; Feb. 28, 1983, 58-32037
Int. Cl.[4] G03B *1/24, 17/42*
U.S. Cl. 354—173.11 13 Claims



4. A film end detector for use in a camera, comprising:
timer means for initiating a timing operation in synchronism with initiation of a power supply to a film winding motor;
detector means for detecting winding of the film length corresponding to one frame;
means for resetting said timer means in response to an output of said detector means when the film length corresponding to one frame has been wound;
means for producing a film end signal when said timer means is not reset by said resetting means within a given detection period after the initiation of said timing operation by said timer means; and
means for changing said detection period,
said detection period changing means detecting the power voltage applied to said film winding motor to automatically begin prolonging the detection period when the measured power voltage is below a predetermined value;
said detection period changing means comprising an A/D converter for converting a power voltage into a digital signal and a logic circuit which is connected to said A/D converter and said timer means.

4,572,638

INTERMEDIATE ACCESSORY FOR A CAMERA

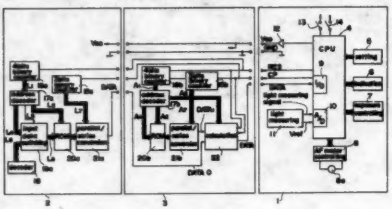
Masaaki Nakai, Nara; Toshihiko Ishimura, Habikino, and Yasuhisa Honda, Sakai, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Apr. 6, 1984, Ser. No. 597,363

Claims priority, application Japan, Apr. 8, 1983, 58-62779

Int. Cl.[4] G03B *17/00*

U.S. Cl. 354—286 **9 Claims**



1. In a photographic lens system having an interchangeable lens with a lens mount and a camera body with a body mount engageable with said lens mount, said camera body receiving plural kinds of information from the lens mounted on said body mount, said plural kinds of information being in accordance with the characteristics of said lens, an intermediate accessory mountable between said lens and said camera body, comprising:

a first mount engageable with said lens mount,

a second mount engageable with said body mount,

means for receiving plural kinds of information from the leng engaged with said first mount in turn to produce a plurality of data signals each respectively representing each kind of information,

means for calculating with said plurality of data signals to produce a plurality of information signals each respectively representing both the characteristic of said lens and the characteristics of said accessory, said calculation being determined in accordance with the kinds of information, and

means for transmitting said plurality of information signals to said camera body engaged with said second mount.

4,572,639

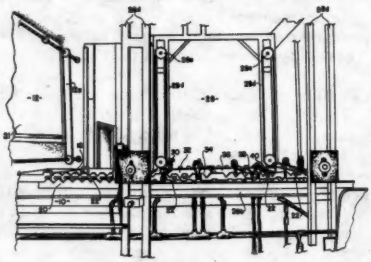
FILM PROCESSING APPARATUS INCLUDING A CONTROL SYSTEM

Richard G. Mackson, 2239 - 26th St., Santa Monica, Calif. 90405

Filed Jul. 13, 1984, Ser. No. 630,634

Int. Cl.[4] G03D *3/10*

U.S. Cl. 354—322 **11 Claims**



1. Apparatus for processing exposed photographic film, comprising: a series of tanks containing different solutions required for processing the film; a horizontally movable inserter positioned adjacent to a selected tank of the series; first drive means coupled to the inserter for moving the inserter to selectable positions along the selected tank; second drive means mounted on said inserter for receiving said film and for first moving said film from a loading position to an upper position in which the film is displaced up from the surface of the solution in the selected tank, and for then moving the film to a lower position in which the film is immersed in the solution in the selected tank; and control means connected to said first and second drive means to move said inserter to said selectable positions along the selected tank as determined by the processing requirements of different films to be processed and also to cause said second drive means to lower the film into the solution in the selected tank at selected predetermined intervals after the inserter has been moved to a selected position along the tank as also determined by the processing requirements of different films to be processed.

4,572,640

PHOTOGRAPHING OPERATION CONTROL DEVICE FOR CAMERA

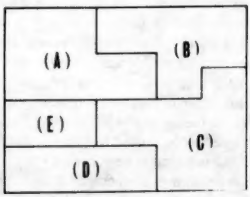
Isao Harigaya, Kanagawa, and Hideo Tamamura, Tokyo, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 416,552, Sep. 10, 1982, abandoned, which is a continuation of Ser. No. 233,335, Feb. 11, 1981, Pat. No. 4,370,043, which is a continuation of Ser. No. 4,270, Jan. 17, 1979, abandoned. This application Jun. 25, 1984, Ser. No. 623,637

Claims priority, application Japan, Jan. 20, 1978, 58-5459; Jan. 20, 1978, 53-5460

Int. Cl.[4] G03B *3/00, 7/16, 7/26, 17/38*

U.S. Cl. 354—400 **11 Claims**



1. An auto-focusing device for a camera comprising:

(a) an object distance measuring circuit for measuring an object distance and producing an output signal corresponding to the object distance;

(b) a control circuit for generating an output signal corresponding to an object distance measured by the measuring circuit when the object distance is shorter than a predetermined limit value for flashing, and generating an output signal corresponding to the limit value irrespective of the object distance when it is beyond the limit value; and

(c) setting means for performing a distance setting operation on the basis of the output signal from the control circuit.

4,572,641

LATCH DEVICE FOR CARTRIDGE COMPARTMENT DOOR OF A CAMERA

Kazuo Ishihara, Toyokawa, and Haruo Kobayashi, Sakai, both of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Oct. 27, 1983, Ser. No. 546,141

Claims priority, application Japan, Nov. 6, 1982, 57-168548[U]

Int. Cl.[4] G03B *1/00*

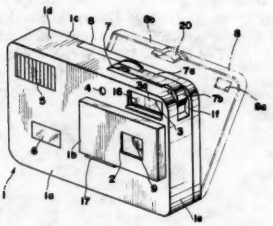
U.S. Cl. 354—121 **5 Claims**

3. A thin vertically disposed camera adapted for use with a disk type film contained cartridge, said camera comprising;

a housing of substantially flat rectangular parallelepiped

configuration defined at least by a relatively large vertical front wall and a first and second side walls adjoining and perpendicular with each other, said housing having a compartment for receiving therein said cartridge and including a door hinged by an axis perpendicular to the optical axis of the picture lens;

a manually operable member rotatably supported by an axis parallel to the axis of the picture lens, said manually operable member being rotatable between a first position where said manually operable member is lifted from said first wall and a second portion where said manually operable



member is falled down onto said first side wall and said manually operable member being provided at its tip end with a bent portion lying along a corner formed by said first and second side walls, said second wall having a recess for receiving therein said bent portion with leaving a clearance to allow a finger tip to be inserted therein; and

means actuated for catching said door at its closing position, said means being interconnected with said manually operable member so as to be actuated when said manually operable member is rotated from its first to second position.

4,572,642

AUTOMATIC FOCUSING DEVICE

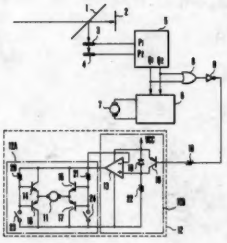
Hiroshi Yamamoto, Kanagawa, and Toshikazu Ichiyanagi, Tokyo, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 16, 1985, Ser. No. 723,668

Claims priority, application Japan, Apr. 16, 1984, 59-76115

Int. Cl.⁴ G03B *3/10*

U.S. Cl. 354—402 **2 Claims**



1. An automatic focusing device comprising:

(a) a lens optical system having a focusing function and a zooming fuction;

(b) an electric motor for moving said lens optical system to effect zooming;

(c) control means for controlling rotation of said motor selectively to high speed rotation and low speed rotation;

(d) focus detecting means for detecting the focusing condition of an object image formed by said lens optical system; and

(e) gate means receptive of a signal of said focus detecting means for detecting a signal for the motor high speed rotation by said control means.

4,572,643

CAMERA CAPABLE OF OPERATING IN AN AUTOMATIC FOCUS ADJUSTING MODE AND A MANUAL FOCUS ADJUSTING MODE

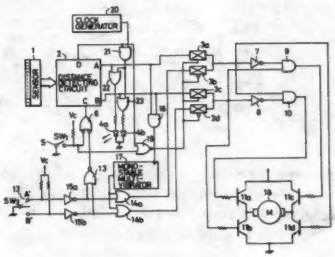
Akira Akashi, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 13, 1984, Ser. No. 570,517

Claims priority, application Japan, Jan. 17, 1983, 58-6069

Int. Cl.⁴ G03B *3/00*

U.S. Cl. 354—409 **18 Claims**



3. A focus adjusting apparatus comprising:

(a) a photo-taking lens whose imaging position is adjustable by varying the lens position.

(b) manually operated switch means for moving the lens position of said photo-taking lens;

(c) drive means for varying the lens position of said photo-taking lens by the signal of said manually operated switch means;

(d) a detecting circuit for detecting the focus state varied by movement of said photo-taking lens, putting out an in-focus signal when the in-focus state is brought about, putting out a near-focus signal when said photo-taking lens is in the near-focus state, and putting out a far-focus signal when said photo-taking lens is in the far-focus state;

(e) a display portion for displaying the in-focus signal, the near-focus signal and the far-focus signal put out by said distance detecting circuit; and

(f) control means for temporarily stopping the driving of said drive means in response to the in-focus signal from said detecting circuit for detecting the in-focus state.

4,572,644

COMPUTER TYPE ELECTRONIC FLASH DEVICE

Hiroyuki Kataoka, Saitama; Masanori Yamada, and Nobuyuki Suzuki, both of Kanagawa, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 447,508, Dec. 7, 1982. This application Oct. 5, 1984, Ser. No. 658,442

Claims priority, application Japan, Dec. 14, 1981, 56-201134; Dec. 14, 1981, 56-201135; Jan. 6, 1982, 57-803

Int. Cl.⁴ G03B *7/00, 15/05*

U.S. Cl. 354—415 **17 Claims**

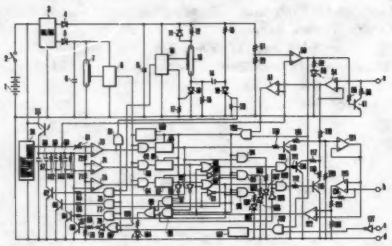
1. A photographic system comprising a camera and a flash device, said system comprising:

(a) flash means, responsive to a shutter release actuating member having a first operating state and a second operating state in which an exposure control operation is initiated, for providing a preliminary flash when the member is in the first state and a main flash as the start of an exposure when in the second state;

(b) signal forming means for producing a first signal corresponding to the reflection of the preliminary flash from an object to be photographed and a second signal corre-

sponding to the reflection of the main flash from the object;

(c) a diaphragm control circuit to control the diaphragm on the basis of said first signal when the exposure control operation is initiated by the operation of said release actuating member; and



(d) a circuit for detecting said second signal for stopping the projection of a main flash onto the object when the second signal reaches a condition representing that the amount of reflected light takes a prescribed value.

4,572,645

EXPOSURE CONTROL DEVICE FOR CAMERA

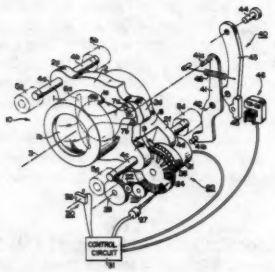
Yoichi Yoshida; Akihiko Hashimoto, both of Hachioji; Tatsuya Suzuki, Chofu; Hitoshi Shirai, Sagamihara; Hiroshi Akitake, and Hirotsugu Nakazawa, both of Hachioji, all of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Nov. 13, 1984, Ser. No. 670,559

Claims priority, application Japan, Feb. 14, 1984, 59-25912

Int. Cl.[4] G03B *7/097*

U.S. Cl. 354—435 **19 Claims**



1. An exposure control device for a camera comprising:

means for determining a required amount of exposure based on photographing information including the brightness of an object being photographed and a film speed;

means for opening a combined diaphragm and sector shutter in response to a release operation;

detector means for detecting an instantaneous position of part of the sector shutter or of a member which is mechanically interlocked therewith to derive a value corresponding to the magnitude of the sector opening;

calculating means responsive to an output from the detector means for calculating an amount of incremental exposure at a given time interval, the amount of incremental exposure being determined on the basis of a predetermined diaphragm aperture and the length of the time interval;

accumulating means interlocked with the opening movement of the sector shutter for accumulating amounts of incremental exposure which are outputted from the calculating means;

decision means for comparing the accumulated value from the accumulating means against the required amount of exposure determined by the first mentioned means and for delivering an output whenever a coincidence is reached therebetween; and

shutter closing means responsive to an output from the decision means by closing the sector shutter.

4,572,646

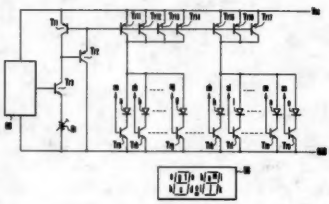
DISPLAY DEVICE IN CAMERA FINDER

Masami Shimizu, Tokyo, and Nobuyuki Suzuki, Kanagawa, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 6, 1985, Ser. No. 698,632

Int. Cl.[4] G03B *17/20*; G09F *9/00*

U.S. Cl. 354—475 **7 Claims**



1. An indicating apparatus for a camera comprising:

(a) a view finder;

(b) information indicating means provided to be displayed in an end portion of said view finder, said indicating means including at least a first indicating member provided to be displayed adjacent said end portion, and a second indicating member provided to be displayed in a farther position than the position where the first indicating member is displayed; and

(c) brightness control means for making the brightness of said first indicating member higher than the brightness of said second indicating member.

4,572,647

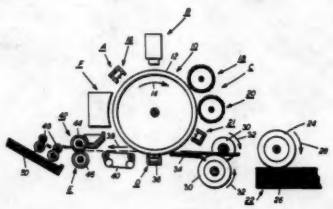
HYBRID DEVELOPMENT SYSTEM

Lloyd F. Bean, Rochester, and Roger L. Miller, Penfield, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Nov. 23, 1983, Ser. No. 554,519

Int. Cl.[4] G03G *15/00*

U.S. Cl. 355—3 R **12 Claims**



1. An electrophotographic printing machine of the type having a photoconductive member, including:

means for recording a modulated latent image on the photoconductive member; and

means for developing the modulated latent image recorded on the photoconductive member with charged, insulating marking particles and magnetic, polar or polarizable

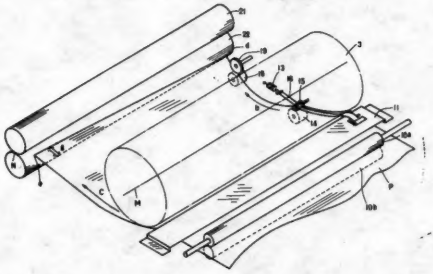
marking particles to form a powder image on the photoconductive member.

4,572,648

IMAGE FORMING APPARATUS

Mototada Toriumi, Yokohama, and Shinji Kanemitsu, Ichikawa, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 21, 1983, Ser. No. 534,311
Claims priority, application Japan, Sep. 30, 1982, 57-171917
Int. Cl.⁴ G03G *15/00*
U.S. Cl. 355—3 FU **5 Claims**



1. An image forming apparatus comprising:
an image bearing member;
means adapted to be engaged with only one lateral end portion of the transfer material to separate the transfer material from said image bearing member;
means for conveying a transfer material separated by said separating means; and
a couple of fixing rollers, forming a nip, for receiving the transfer material from said conveying means and fixing an image on the transfer material, the nip extending inclinedly with respect to a direction perpendicular to the direction of movement of the transfer material to said fixing rollers, wherein that part of the nip which is engageable with said one lateral end of the transfer material, is upstream of that part of the nip which is engageable with the other lateral end of the transfer material with respect to the movement of the transfer material toward said fixing rollers.

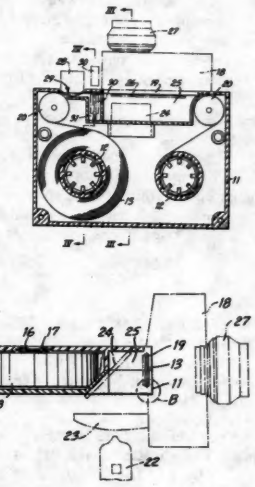
4,572,649

FILM CASSETTE FOR ELECTROPHOTOGRAPHIC CAMERA PROCESSOR-READER

Michihiko Takahashi; Eiichi Saito, both of Tokyo, and Takeshi Okano, Nishinomiya, all of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Aug. 27, 1984, Ser. No. 644,516
Int. Cl.⁴ G03G *15/00*
U.S. Cl. 355—3 R **6 Claims**

1. A film cassette of a kind which contains an electrophotographic film in web form therein and which is adapted to be loaded in an electrophotographic camera processor-reader recording picture image data on the electrophotographic film and projecting the picture image data recorded on the electrophotographic film, said film cassette comprising a cassette casing containing a pair of rotatable reels around which the electrophotographic film is wound at both ends thereof, an aperture formed in said cassette casing to be positioned opposite an electrophotographic process head mounted on said electrophotographic camera processor-reader including a charging section, an exposure section, a developing section and a fixing section for sequentially performing a series of processing on the electrophotographic film in the above order, and a reflecting-mirror insertion cavity formed in said cassette casing to permit insertion, in inclined relation therein, of a reflecting mirror reflecting light emitted from a projecting light source of said electrophotographic camera processor-reader to direct



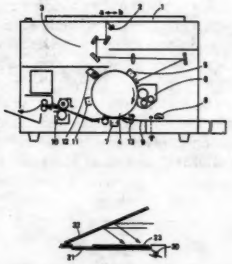
the light toward a projecting lens of said electrophotographic camera processor-reader.

4,572,650

SIZE DETECTING DEVICE OF A COPY DOCUMENT SUITABLE FOR ELECTROPHOTOGRAPHIC COPYING MACHINE

Masakiyo Okuda, Kashiwara, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Oct. 14, 1982, Ser. No. 542,211
Claims priority, application Japan, Oct. 25, 1982, 57-187966
Int. Cl.⁴ G03G *21/00*
U.S. Cl. 355—3 SH **5 Claims**



1. A device for detecting the size of a document to be copied in an electrophotographic copying machine, comprising:
a document table for supporting said document;
a reflective document cover for reflecting light associated with said copying machine and for reflecting surrounding light, said document cover being adjustably disposed in an overlying relationship to said document table;
optical scanning means operatively associated with said document disposed on said document table;
sensor means for determining the amount of light reflected

from said document cover onto the document disposed on said document table, said sensor means including at least two light receiving elements directed to detect, in combination, a single size of said document;

said at least two light receiving elements being connected in parallel and in opposing directions wherein said light receiving elements output signals which are representative of the amount of light reflected from said document cover;

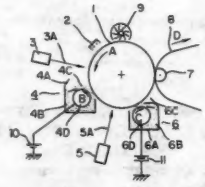
detection means responsive to said output signals for determining the size of said document, said detection means including operational amplifier means for amplifying said signals and applying said signals to a comparator means for comparing said output signals and calculating a difference between said signals, said calculated difference in output signals being representative of the size of said document.

4,572,651

METHOD FOR DEVELOPING AN ELECTROSTATIC LATENT IMAGE IN AN ELECTROPHOTOGRAPHIC RECORDING APPARATUS

Isamu Komatsu, Takahagi; Masayasu Anzai, and Nobuyoshi Hoshi, both of Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed May 14, 1982, Ser. No. 378,173
Claims priority, application Japan, May 15, 1981, 56-72181
Int. Cl.⁴ G03G *15/01, 13/01*
U.S. Cl. 355—4 **5 Claims**



1. A method for electrophotographically recording a color image by using an electrophotographic recording apparatus comprising a rotatable photoconductive drum, the method comprising the steps of uniformly charging the surface of the photoconductive drum, exposing the charged photoconductive drum in a first exposure means to form a first electrostatic latent image, providing a first developing means containing a first two-component developer for reversal development of the first electrostatic latent image, disposing a second exposure means downstream of the first developing means in the rotational direction of the photoconductive drum, providing a second developing means containing a second two-component developer for reversal development of the second electrostatic latent image, and providing a toner-to-carrier ratio of said first two-component developer which is less than a ratio of said second two-component developer.

4,572,652

COPYING MACHINE WITH AUDIBLE INDICATOR MEANS

Mitsuro Tada, Nara; Takeshi Ikegami, Kurashiki, and Hisao Komori, Nara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 98,131, Nov. 28, 1979, abandoned. This application Aug. 4, 1982, Ser. No. 405,167
Claims priority, application Japan, Nov. 29, 1978, 53-148041
Int. Cl.⁴ G03G *15/00*
U.S. Cl. 355—14 R **8 Claims**

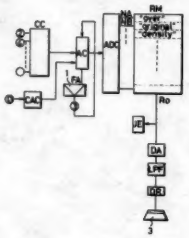
1. An audible indicator means for use in a copying machine, comprising:

a plurality of detector means for monitoring the operating condition of the copying machine;

memory means for storing therein a plurality of operational statements indicative of the operation and the operational condition of the copying machine;

control circuit means connected between the detector means and the memory means for selecting respective ones of the statements from the memory means in response to the outputs from the detector means and for developing an output signal indicative of the selected statements; and

an audible sound generation means responsive to the output signal from said control circuit means for converting the selected statements into audible sounds indicative of the operation and the operational condition of the copying machine;



said control circuit means including a plurality of flip-flop means respectively connected to said plurality of detector means, said flip-flop means each developing an output signal indicative of the respective operational condition associated with its respective detector means;

a plurality of decision circuit means respectively connected to said plurality of flip-flop means for deciding whether a set output signal is being generated from its respective flip-flop means;

control circuit means connected to said decision circuit means for developing micro-instructions in response to the respective set output signals from said flip-flop means; and

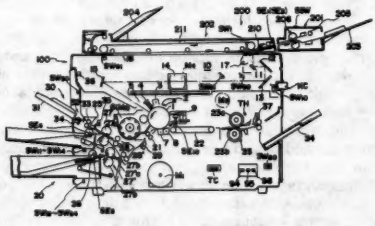
means responsive to the micro-instructions for selecting the respective ones of the operatinal statements from the memory means in response thereto.

4,572,653

IMAGE DENSITY CONTROL APPARATUS FOR COPYING MACHINES

Masazumi Ito, Toyohashi; Yutaka Irie; Yoshikazu Ikenoue, both of Toyokawa, and Minoru Nakamura, Toyohashi, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Jul. 13, 1984, Ser. No. 630,721
Claims priority, application Japan, Jul. 15, 1983, 58-130135
Int. Cl.⁴ G03G *15/00*
U.S. Cl. 355—14 R **6 Claims**



1. In a copying machine having a mechanism for projecting a predetermined density pattern on a photoconductive surface

through an image projecting optical system, developing the resulting pattern image, detecting the density of the developed image on the surface of the photoconductive surface by density sensor means and controlling the density of the image to be formed on the photoconductive surface in accordance with the detected density, and a magnification control system for varying the magnification of the image to be projected on the photoconductive surface by controlling the image projecting optical system, an image density control apparatus comprising:

a reference pattern so positioned as to be projectable on the photoconductive surface by the optical system and having its size so determined that even when a minimum copy magnification is set by the magnification control system, the projected image has a predetermined area at least required for detecting the density,

means for limiting an area of charge bearing portion of the photoconductive surface produced by projection of the pattern to a constant area, said means being so positioned to limit the area posterior to charging the photoconductive surface and prior to developing thereof, and

a control means for controlling the area limiting means in relation with the timing of projection of the reference pattern on the photoconductive surface with the operation of the copying machine,

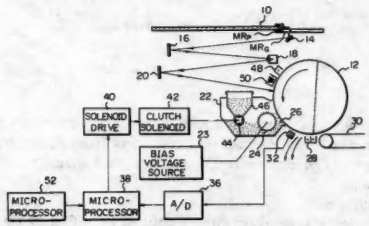
whereby the area of charge bearing portion of the photoconductive surface which is to be developed and to be detected is rendered definite irrespective of the copy magnification.

4,572,654

IMAGE DENSITY CONTROL METHOD FOR ELECTROPHOTOGRAPHY

Kazuo Murai, and Yutaka Hasegawa, both of Tokyo, Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Nov. 15, 1982, Ser. No. 441,359
Claims priority, application Japan, Nov. 17, 1981, 56-184289
Int. Cl.[4] G03G *15/00*
U.S. Cl. 355—14 D **4 Claims**



1. A control method for an electrophotographic apparatus comprising the steps of:

forming first and second toner images having first and second different respective densities on a photoconductive member;

sensing the first and second densities;

dividing a first predetermined function of the first density by a second predetermined function of the second density to obtain a ratio;

comparing the ratio with a first predetermined value;

controlling a predetermined operation of the electrophotographic apparatus which affects image density in accordance with whether the ratio is above or below the first predetermined value;

the first and second toner images being formed adjacent to each other on the photoconductive member and sensed while the photoconductive member is being moved; and

detecting a transition between the first and second toner images by comparing the first and second densities with a second predetermined value which is intermediate between possible ranges of the first and second densities;

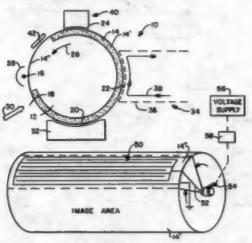
the first and second predetermined functions comprising average value of the first and second densities over first and second respective predetermined lengths of time.

4,572,655

ELECTROPHOTOGRAPHIC COPYING APPARATUS AND METHOD OF USE INCLUDING ELECTROSTATIC TONER RECYCLING PROCEDURE

Elden R. Morrison, Palo Alto; Edward F. Mayer, San Jose; Donald F. Pfeuffer, San Jose, and Victor B. van Blerk, San Jose, all of Calif., assignors to Ricoh Systems, Inc., Tokyo, Japan

Filed Jul. 25, 1983, Ser. No. 516,954
Int. Cl.[4] G03G *21/00*
U.S. Cl. 355—15 **16 Claims**



1. An apparatus for electrophotographically copying information from a given master, comprising

(a) means including a rotatable drum having a photosensitive coating on its entire outer circumferential surface;

(b) means for rotating said drum about its longitudinal axis in a controlled fashion such that said photosensitive outer circumferential surface moves along a fixed annular path;

(c) means for forming a given electrostatic image corresponding to said information on a first circumferential segment of said drum surface;

(d) means for applying toner from a given toner storage area onto the image bearing first segment of said drum surface in a way which develops said image;

(e) means for transferring applied toner from said first segment of said drum to a support surface to form a copy of said image;

(f) toner moving means for causing any applied but untransferred toner on the first segment of said drum surface to be moved onto a second circumferential segment of said drum at a first point on said annular path;

(g) means for rotating said drum in a way which moves said second segment from said first point to a second point on said annular path; and

(h) means located on said second segment for electrostatically holding said moved toner on said second surface segment while said second segment moves from said first point to said second point and for removing the toner on said second segment from the latter when the second segment reaches said second point, said holding and removing means being configured to establish an area of electrostatic contrast on said second surface segment for enhancing the toner holding capabilities of said holding means for aiding in attracting toner particles to said second surface segment by means of a resultant electrostatic field or fields, said electrostatic holding and toner removing means includes means for energizing an electrostatic clamp in the shape of a grid on said second segment of said drum surface during the period of time that said second segment moves from said first point to said second point whereby to establish said areas of electrostatic contrast and resultant fields for holding said toner on said second segment and means for later de-energizing said clamp for eliminating said electrostatic grid when said second seg-

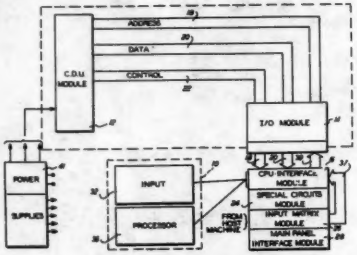
ment reaches said second point whereby to allow the toner on said second segment to be removed therefrom.

4,572,656

MESSAGE QUE INTERACTIVE CONTROL CONSOLE

Neal S. Buchalter, Fairport; Henry E. Mannella, Webster, and Robert A. Burkett, Fairport, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Oct. 30, 1979, Ser. No. 89,433
Int. Cl.[4] G03B *27/52*
U.S. Cl. 355—24 **1 Claim**



1. In a reproduction machine having a document handler, a paper tray, an operator console having a number of selection switches for performing a plurality of machine operations including duplex operation and providing a plurality of displayable messages, the method of sequentially instructing the operator in operating the reproduction machine including the steps of:

selecting the duplex mode of operation,

instructing operator action by a particular message display with regard to the paper tray,

inhibiting the display upon operator action,

instructing the operator with regard to documents in the document handler by another message display,

inhibiting the display upon operator action,

again instructing the operator with regard to the paper tray,

inhibiting the display upon operator action, and

again instructing the operator with regard to documents in the document handler by an on-off instruction if the operation has not been performed and by a steady state instruction if the operation has been performed.

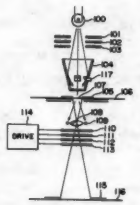
4,572,657

COLOR PRINTER

Tadashi Amano; Yasuaki Sato, and Yasuo Ohkoshi, all of Hachioji, Japan, assignors to Konisiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Jun. 3, 1983, Ser. No. 501,004
Claims priority, application Japan, Jun. 10, 1982, 57-100086; Jun. 11, 1982, 57-101225
Int. Cl.[4] G03B *27/80*
U.S. Cl. 355—38 **2 Claims**

1. A color printer comprising: an exposure light, first light receiving and measuring means for measuring the densities of blue, green and red colors of a reference print image prepared previously corresponding to an original color picture used to set the standard copying conditions, means for memorizing the density information obtained by said measurement, second light receiving and measuring means for measuring the densities of blue, green and red colors of a newly formed copy print image by using said original color picture, and operation means for operating upon the density information from said reference print image and said copy print image to determine and automatically set at least the standard copying conditions for the printer corresponding to those conditions for a photosensitive copying medium, said first and second light receiving means comprising common light receiving detector means arranged in a first optical path of said exposure light, which first path is outside of a second optical path between said exposure light



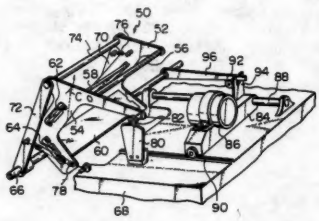
and said photosensitive copying medium, whereby said common light receiving detector means does not interface with printing.

4,572,658

VARIABLE MAGNIFICATION IMAGING DEVICE FOR COPIER

Shigeru Suzuki, Yokohama, and Yuji Yasuda, Kawasaki, both of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Sep. 15, 1983, Ser. No. 532,327
Claims priority, application Japan, Sep. 17, 1982, 57-161908
Int. Cl.[4] G03B *27/34*
U.S. Cl. 355—57 **14 Claims**



1. A variable magnification imaging device which defines a variable length optical path extending from an original document to a predetermined image area, said imaging device comprising:

a mirror;

parallelogram linkage means defined by a first axis extending perpendicular to the optical path, a second axis parallel to and rotatable about said first axis, a third axis parallel to the first axis, and a fourth axis parallel to and rotatable about said third axis, said linkage means carrying the mirror therewith; and

drive means for driving the parallelogram linkage means to shift the mirror to a position for establishing one of a plurality of alternative magnifications.

4,572,659

ILLUMINATING APPARATUS

Takashi Omata, Yokosuka, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 3, 1983, Ser. No. 538,743
Claims priority, application Japan, Oct. 5, 1982, 57-175848
Int. Cl.[4] G03B *27/54*
U.S. Cl. 355—67 **4 Claims**

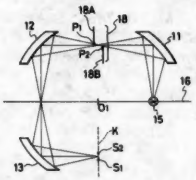
1. An apparatus for illuminating a surface to be illuminated, with an arcuate light source image, said apparatus comprising:

means for providing a point source of light;

an imaging optical system for imaging said point source of

light as an arcuate image, said imaging optical system including concave mirror means;

a relay imaging optical system for re-imaging said arcuate light source image on the surface to be illuminated, said relay imaging optical system concave mirror means; and



an arcuate opening means including a first member having a concave edge and a second member having a convex edge, said second member being located nearer to said point source of light as compared with said first member and said first member being located nearer to said relay imaging optical system as compared with said second member.

4,572,660

PHOTOGRAPHIC FILM COPYING APPARATUS

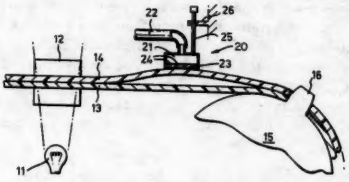
Ian D. Gooch, and Ian G. Thom, both of Edinburgh, Scotland, assignors to Ferranti plc, Cheshire, England

Filed Mar. 6, 1984, Ser. No. 586,834

Claims priority, application United Kingdom, Mar. 11, 1983, 8306841

Int. Cl.⁴ G03B *27/04*

U.S. Cl. 355—99 **5 Claims**



1. Film copying apparatus comprising:

an exposure gate;

a drive sprocket engaging in holes in contiguous strips of film for pulling the film strips past the exposure gate, the drive sprocket, by virtue of the sprocket teeth profile, introducing a longitudinal displacement between strips; and

diversion means operable to divert the path of the lagging strip out of the plane of the path taken by the other strip between the exposure gate and the drive sprocket by an amount which causes said lagging strip to be longitudinally advanced, relative to the other strip, at the exposure gate by the same amount as the longitudinal displacement introduced by the drive sprocket teeth.

4,572,661

TESTER FOR A COPIER

Christopher C. King, Paterson, N.J., assignor to Monroe Systems for Business, Inc., Morris Plains, N.J.

Filed Aug. 30, 1982, Ser. No. 412,618

Int. Cl.⁴ G03G *15/08*

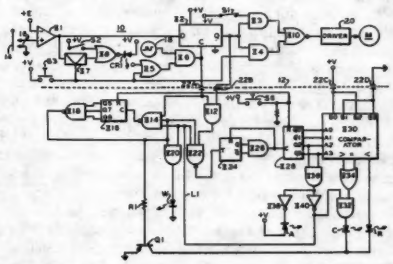
U.S. Cl. 355—3 DD **8 Claims**

8. A copier having toner-carrying developer and means for monitoring the developer, comprising:

sensor means for producing a sensed signal signifying the volumetric properties of the developer;

input means for providing a processed signal in response to said sensed signal, said processed signal indicative of the amount of developer to be placed in a copier storage reservoir during an initial start-up operation;

means responsive to the frequency of said processed signal for determining the manner in which the amount of developer in the copier storage reservoir should be adjusted to attain a correct amount of developer; and



indication means coupled to said determining means for providing an indication that the proper amount of developer has been placed in the copier storage reservoir,

wherein said indication means comprises counting means for repetitively sensing said sensed signal and counting during a predetermined interval the number of times said sensed signal is in said predetermined state, said indication means being operable to provide an indication of the count of said counting means.

4,572,662

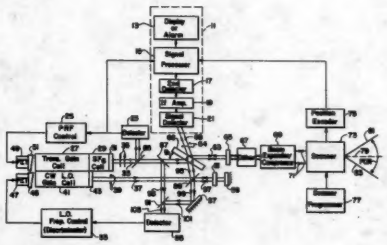
WIRE AND WIRE LIKE OBJECT DETECTION SYSTEM

Bernard B. Silverman, West Hartford, Conn., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Nov. 5, 1982, Ser. No. 439,466

Int. Cl.⁴ A01C *3/08*; G01B *11/26*

U.S. Cl. 356—5 **6 Claims**



1. An optical radar adapted to detect elongated objects in the path of a low flying aircraft, comprising: a pulsed optical transmitter laser comprising a continuous wave (CW)CO_2 gain cell which is constrained to emit optical flux plane polarized in a given direction, said transmitter being passively Q-switched by means of a gaseous cell within the cavity thereof, a first control loop adapted to control the optical frequency and pulse repetition frequency (PRF) of said transmitter, a continuous wave (CW) local oscillator laser operating at a frequency offset from said transmitter frequency by a fixed intermediate frequency, said local oscillator being constrained to emit plane polarized optical flux orthogonal to that emitted by said transmitter, a second control loop responsive to the optical flux

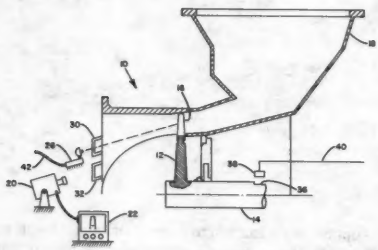
from said transmitter and the optical flux from said local oscillator for controlling the optical frequency of said local oscillator laser to maintain said fixed intermediate frequency offset between said transmitter flux and said local oscillator flux, a duplexer comprising a dielectric plate substantially transparent at the operating frequencies of both of said lasers, said duplexer being disposed in the path of said transmitter's flux output at its Brewster angle so that transmitter flux with said given direction of polarization will pass therethrough along a first path toward the output of said radar and target echo signals with said orthogonal direction of polarization returning to said transmitter from the target along said first path will be reflected by said duplexer along a second path disposed at an angle with respect to said first path, said duplexer being also disposed in the path of said local oscillator laser flux output at its Brewster angle so that said local oscillator flux with said orthogonal direction of polarization will pass therethrough along said second path and mix with said target echo signals, said transmitter flux passing along said first path toward the output of the radar through a quarter wave plate and a beam expander-compressor to a scanner, said scanner being adapted to move the transmitted optical beam over a desired scanning pattern, a scanning programmer and drive mechanism and a position encoder connected to said scanner, said target echo signals passing through said scanner, beam expander/compressor and quarter wave plate and emerging from said quarter wave plate with plane polarization in said orthogonal direction, whereby said target echo signals will be reflected by said duplexer along said second path to a receiver, said receiver comprising a signal detector to which said target echo signals from said duplexer and said local oscillator output signals from said duplexer are applied, means to detect said intermediate frequency in the output of said signal detector, and a signal processor adapted to process the target signal echoes applied thereto from said signal detector and correlate them with the output of said position encoder to operate a display or alarm circuit connected to said signal processor circuit.

4,572,663

METHOD AND APPARATUS FOR SELECTIVELY ILLUMINATING A PARTICULAR BLADE IN A TURBOMACHINE

Kenneth H. Greene, Latrobe, and Carl H. Geary, Greensburg, both of Pa., assignors to Elliott Turbomachinery Co., Inc., Jeannette, Pa.

Filed Dec. 22, 1983, Ser. No. 564,141
Int. Cl.⁴ G01P *3/40*
U.S. Cl. 356—23 **16 Claims**



1. A method of monitoring the condition of blades mounted to a rotary shaft in a turbomachine which comprises the steps of:

detecting the rotational position of the shaft;

generating a signal in response to the position of the shaft;

dividing the signal into a plurality of position signals each representing a portion of a revolution of the shaft;

determining the rotational position of the shaft by monitoring the position signals; and

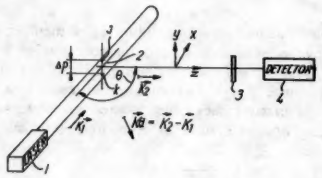
illuminating at least one blade when the step of determining ascertains the shaft is in a rotational position such that the blade to be inspected is in the desired position.

4,572,664

METHOD OF MEASURING VELOCITY GRADIENTS IN A FLOWING MEDIUM AND APPARATUS FOR CARRYING OUT THE METHOD

Vagn S. G. Hanson, Fakse, Denmark, assignor to Forsogsanleg Riso, Roskilde, Denmark

Filed Mar. 28, 1983, Ser. No. 479,777
Claims priority, application Denmark, Apr. 7, 1982, 1610/82
Int. Cl.⁴ G01P *3/36*
U.S. Cl. 356—28.5 **21 Claims**



2. Apparatus for measuring velocity gradients in a sample volume in a flowing medium comprising a source of electromagnetic radiation, especially a laser, means for directing said electromagnetic radiation towards said sample volume, a detector for receiving scattered radiation originating from particles in said sample volume, means for recording output signals from said detector, and an optical element in the radiation path from said sample volume to said detector, which optical element has such properties and is arranged in such manner that part of the radiation originating from two particles occurring simultaneously in said sample volume and mutually spaced a distance determined by said optical element has parallel phase surfaces after having passed said optical element and by said detector is converted into an electric signal representing the difference in the Doppler shift between said two particles.

4,572,665

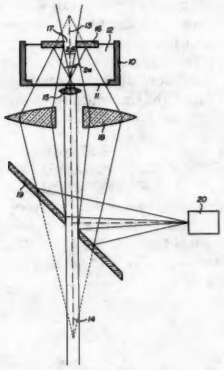
APPARATUS FOR MEASURING THE REFRACTIVE INDEX OF AN OPTICAL FIBER

Pierre Benoit, Athenaz, Switzerland, assignor to Promogap, Geneva, Switzerland

Filed Nov. 9, 1983, Ser. No. 550,246
Claims priority, application Switzerland, Nov. 15, 1982, 6648/82
Int. Cl.⁴ G01N *21/41, 21/84*
U.S. Cl. 356—73.1 **4 Claims**

1. In an apparatus for measuring the refractive index of an optical fiber using the "refracted near-field technique" comprising a rigid frame supporting a vessel adapted to move along three orthogonal axes, said vessel being further adapted to hold an index liquid and having a bottom provided with a horizontally disposed transparent window; means above said vessel for supporting a fiber to be analyzed and for positioning said fiber with an end thereof adjacent and perpendicular to said transparent window; a light source in combination with a primary optical device for directing a light beam along the optical axis of said fiber through its end adjacent said transparent window; means for eliminating the portion of the resulting light cone representing guided and leaky modes; and a detector for measuring the portion of the light cone representing the remaining modes, the improvement in which said detector is annular-shaped having its annulus coaxial with said fiber end and with

at least the surface thereof facing the directed light beam being immersed in the index fluid in said vessel, said annulus comprising said means for eliminating the portion of the light cone representing guided and leaky modes.

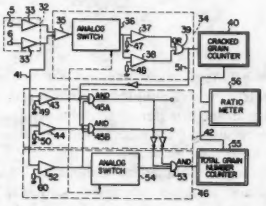


4,572,666

APPARATUS FOR DETECTING CRACKED RICE GRAIN

Toshihiko Satake, Higashihiroshima, Japan, assignor to Satake Engineering Co., Ltd., Tokyo, Japan

Filed Mar. 9, 1982, Ser. No. 356,281
Claims priority, application Japan, Mar. 13, 1981, 56-36809
Int. Cl.[4] G01N *21/85, 21/89*
U.S. Cl. 356—239 **9 Claims**



1. An apparatus for detecting cracked rice grains, comprising:

path-defining means for defining a predetermined path having located thereon a detecting position adapted to detect rice grains passing successively one by one along said predetermined path;

light beam-directing means for directing a light beam to each of the rice grains successively passing along said predetermined path and over said detecting position so as to cause the light beam to be transmitted through the rice grain;

first and second light-sensing means for sensing light quantities transmitted respectively through the leading and trailing parts of each of the rice grains passed over said detecting position, to generate respectively first and second signals representative of the respective sensed light quantities;

cracked grain detection circuit means electrically connected to said first and second light-sensing means for receiving said first and second signal each time a rice grain passes over said detecting position for comparing the difference in light quantity between said first and second signals with a predetermined threshold value, such that when said difference in light quantity exceeds said predetermined threshold value a third signal is generated;

cracked grain counter means electrically connected to said cracked grain detection circuit means for successively receiving and counting the number of the third signals representative of the number of the cracked rice grains;

total grain number detection circuit means electrically connected to one of said first and second light-sensing means for generating a confirmation signal each time a rice grain passes over said detecting position; and

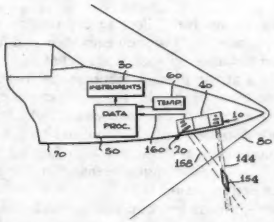
total grain number counter means electrically connected to said total grain number detection circuit means for successively receiving the confirmation signals therefrom for counting the number of the confirmation signals representative of the total number of the rice grains passed over said detecting position.

4,572,667

FLUORESCENT AIR DATA MEASUREMENT DEVICE

Philip L. Rogers, Granada Hills, Calif., assignor to Lockheed Corporation, Burbank, Calif.

Filed Dec. 8, 1981, Ser. No. 328,476
Int. Cl.[4] G01N *21/64*
U.S. Cl. 356—317 **9 Claims**



1. A fluorescent air data measurement device for measuring air data parameters, such as density, pressure, and/or barometric altitude, comprising:

first means for causing gaseous molecules to emit fluorescence, the region of said fluorescence being generally oriented as a beam centered about a first axis passing through a detection volume;

second means having a field of view oriented about a second axis also passing through said detection volume for generating a first output signal representative of the intensity of said fluorescence of said gaseous molecules within said detection volume, said detection volume being defined by the intersection of said fluorescence beam with said field of view and being situated in a free airstream; and

third means responsive to said first output signal and to a second output signal representative of temperature for generating a third output signal representative of an air data parameter.

4,572,668

APPARATUS AND METHOD FOR PHOTOLUMINESCENT ANALYSIS

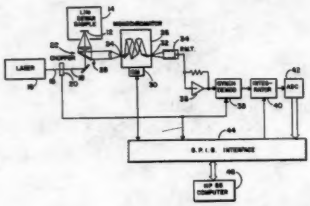
Gerry L. Auth, Laguna Beach, Calif., assignor to MIDAC Corporation, Costa Mesa, Calif.

Filed Aug. 26, 1982, Ser. No. 411,603
Int. Cl.[4] G01J *3/443;* G01N *21/63*
U.S. Cl. 356—318 **4 Claims**

1. In a system for determining the intensity of photoluminescence emitted at the surface of a sample, such system having in its input portion a laser radiation source which provides a highly concentrated, essentially circular beam of radiation for sample-excitation purposes, and having in its output portion a photodetector and a grating spectrometer which receives sample-emitted radiation at its entrance slit and sends radiation through its exit aperture to the photodetector; an optical appa-

ratus, operative between the source of excitation radiation and the grating spectrometer, comprising:

pre-sample optical means for reshaping the laser beam radiation in such a way that it has cross-sectional dimensions proportionally similar to those of the grating spectrometer slit at the location of excitation contact of the laser beam with the sample, the pre-sample optical means including (a) a first optical element which widens the laser beam in one dimension, and (b) a second optical element which receives the laser beam from the first optical element and narrows the beam in the other dimension; and



post-sample means for collecting the radiation emitted by the sample as a result of such excitation and focusing such collected radiation in such a way that its cross-sectional dimensions at the grating spectrometer entrance slit are similar to those of the slit, the post-sample optical means including (a) a first optical element which collects the relatively dispersed radiation emitted by the sample, and (b) a second optical element which focuses the radiation collected by the first optical element on the grating spectrometer entrance slit;

a single dual-purpose lens constituting both the second optical element of the pre-sample optical means and the first optical element of the post-sample optical means.

4,572,669

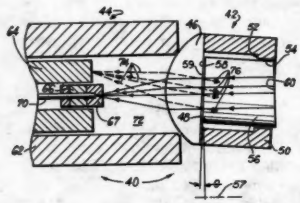
METHOD AND APPARATUS FOR A FABRY-PEROT MULTIPLE BEAM FRINGE SENSOR

Kenneth A. James, Corona Del Mar; William H. Quick, La Habra Heights, and Virgil H. Strahan, Orange, all of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Continuation-in-part of Ser. No. 5,265, Jan. 22, 1979, Pat. No. 4,329,058. This application Oct. 10, 1979, Ser. No. 83,489

Int. Cl.⁴ G01B *9/02*

U.S. Cl. 356—352 **18 Claims**



1. An optical transducer for sensing a physical parameter, said transducer comprising:

first and second light transmitting means, and

Fabry-Perot gap means,

said first light transmitting means positioned so as to supply incident light signals to said Fabry-Perot gap means,

said second light transmitting means positioned so as to receive output light signals that pass through said Fabry-Perot gap means, said Fabry-Perot gap means having a dimension that is sensitive to change in the parameter, the spectral characteristics of the output light signals passing through said Fabry-Perot gap means to said second light transmitting means providing an indication of the dimension of said gap means and, accordingly, the physcial parameter to be sensed,

said Fabry-Perot gap means being tilted relative to a reference plane that is aligned perpendicular to the optical axis of said first light transmitting means.

4,572,670

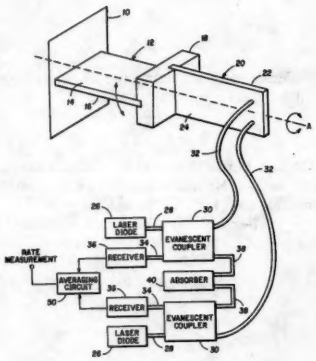
INTERFEROMETRIC PIEZOELECTRIC CHANGE OF STATE MONITOR

Lee R. Fredrickson, Cedar Rapids, Iowa, assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Oct. 25, 1982, Ser. No. 436,257

Int. Cl.⁴ G01B *9/02*

U.S. Cl. 356—363 **6 Claims**



1. An interferometric measurement system comprising:

a piezoelectric crystal coupled to an aircraft and having at least one surface oriented so that it is displaced in response to forces resulting from aircraft movement about one of its pitch, roll or yaw axes; and

an interferometer coupled to said crystal and being constructed and arranged to detect said displacements for providing an output signal indicative of the magnitude of said forces.

4,572,671

DENSITOMETER FOR AN ELECTROPHORESIS APPARATUS

Nobutaka Kaneko, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Jul. 15, 1983, Ser. No. 514,296

Claims priority, application Japan, Jul. 20, 1982, 57-126278

Int. Cl.⁴ G01N *21/00*

U.S. Cl. 356—444 **11 Claims**

1. A densitometer for an electrophoresis apparatus, comprising:

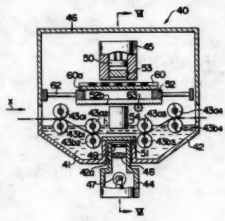
a light projector for emitting light flux to detect the density distribution of fractionated patterns of a specimen to be examined after an electrophoresis process is completed;

a light receiver for receiving the light flux from said light projector;

a plurality of carrier supporter means disposed between said light projector and said light receiver for supporting carriers to which the specimen has been applied, after the electrophoresis process is completed; and

scanning means for scanning said light projector and said light receiver at a station for detecting the specimen on

said carrier which is supported by one of said carrier supporter means, in the direction along which fractionated patterns of said specimen are formed;



the density distribution of fractionated patterns of said specimen on said carrier which is supported by one of said carrier supporter means being detected by an output of said light receiver.

4,572,672

SURFACE COATING CHARACTERIZATION METHOD AND APPARATUS

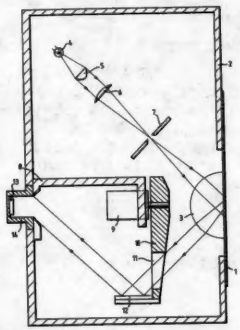
Stanley E. Orchard, Stoke Poges, and Celia C. Taylor, Slough, both of England, assignors to Imperial Chemical Industries PLC, London, England

Filed Jan. 31, 1983, Ser. No. 462,454

Claims priority, application United Kingdom, Feb. 19, 1982, 8204933

Int. Cl.⁴ G01N *21/47, 21/01*

U.S. Cl. 356—446 **6 Claims**



1. A method for the characterisation of a surface coating film containing a metallic flake pigment, the method comprising the steps of (a) illuminating a plane specimen of the film with a parallel beam of light which is inclined at a fixed angle of incidence substantially greater than zero relative to the normal with respect to the film surface and (b) measuring the intensity of light reflected from the film at a plurality of azimuthal viewing positions at each of which there is intercepted a beam of light reflected from a point on the film surface within the illuminated area thereof, the positions being located in a circle which lies in a plane parallel to the film surface and through the centre of which the film normal at that point passes.

4,572,673

TREATMENT OF MOLTEN MATERIALS

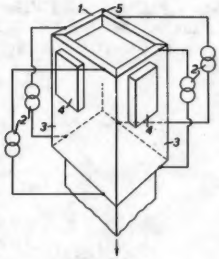
Malcolm Porter, Cockermouth, and Robert Dodgson, Workington, both of England, assignors to British Steel Corporation, England

Continuation of Ser. No. 465,688, Feb. 11, 1983, abandoned. This application Feb. 1, 1985, Ser. No. 697,209

Claims priority, application United Kingdom, Feb. 12, 1982, 8204212

Int. Cl.⁴ B01F *11/02*

U.S. Cl. 366—127 **13 Claims**



7. A method of promoting stirring of molten metal material contained within a receptacle in which polyphase alternating currents are passed through electrically conductive elements comprising wall elements of a mold or vessel containing the molten material by joining both current connections of one or more transducers to the conductive elements to induce magnetic fields within the molten material and to promote stirring thereof.

4,572,674

APPARATUS FOR MIXING BATCHES OF FLOWABLE SOLID MATERIALS

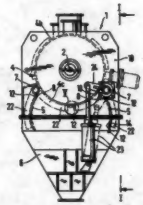
Paul Mathis, Merdingen, and Max Zimmer, Efringen-Kirchen, both of Fed. Rep. of Germany, assignors to Mathis System-Technik GmbH, Neuenburg, Fed. Rep. of Germany

Filed Oct. 15, 1984, Ser. No. 661,111

Claims priority, application Fed. Rep. of Germany, Oct. 14, 1983, 3337437

Int. Cl.⁴ B01F *7/02, 15/02*

U.S. Cl. 366—192 **25 Claims**



1. Apparatus for mixing batches of flowable solid materials, comprising a substantially tubular and substantially horizontal housing defining a mixing chamber, said housing including spaced-apart end walls; a tubular shell disposed between said end walls and having a lower portion provided with an opening extending between said end walls to allow for evacuation of the contents of the mixing chamber; at least one door movable relative to said shell and said end walls between first and second positions in which said opening is respectively exposed and closed; and coupling means defining for said door a pivot axis for movement between said positions, said door having a

marginal portion adjacent to said coupling means, extending between said end walls and having a first edge face, said door further having an external surface making with said edge face an acute angle and said shell having a second edge face complementary to and abutting against said first edge face in the second position of said door.

4,572,675

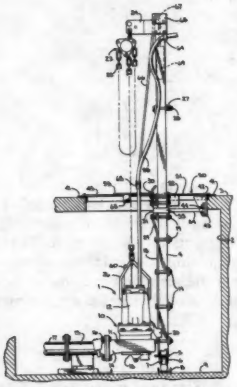
APPARATUS FOR AGITATING AND PUMPING A LIQUID SLURRY

James R. Roberts, Grayslake, Ill., assignor to A. O. Smith Harvestoe Products, Inc., Arlington Heights, Ill.

Filed Jun. 21, 1984, Ser. No. 622,989

Int. Cl.[4] B01F *7/16*

U.S. Cl. 366—263 **16 Claims**



1. An apparatus for agitating and pumping a liquid, a vessel to contain the liquid, a vertical column disposed in the vessel with the upper end of the column projecting above the level of the vessel, means for supporting said column for rotation about its axis and including journalling means disposed adjacent the upper end of said vessel, a motor-pump unit, first guide means on said column with the upper end of said first guide means terminating above said vessel, and second guide means on said motor-pump unit and engageable with said first guide means for guiding said motor-pump unit for vertical movement on said column, said second guide means being freely disengaged with said first guide means on elevation of said motor-pump unit to a predetermined elevated position, said first guide means comprising a track, said track having an outwardly inclined section disposed to avoid inteference with said journalling means.

4,572,676

METHOD AND APPARATUS FOR DETERMINING THE SATURATION TEMPERATURE OF A SOLUTION

Andreas J. Biermans, Urmond; Henk C. Burks, Oirsbeek, and Karel G. H. Raemaekers, Munstergeleen, all of Netherlands, assignors to Unie van Kunstmestfabrieken B.V., Utrecht, Netherlands

Filed Jul. 20, 1983, Ser. No. 515,502

Claims priority, application Netherlands, Jul. 28, 1982, 8203013

Int. Cl.[4] G01J *5/58*; G01N *25/12*

U.S. Cl. 374—17 **8 Claims**

1. Apparatus for determining the saturation temperature of a solution by optically detecting the dissolution of crystals in said solution as the solution temperature is varied, comprising

an optical measurement vessel adapted to contain said solution,

means for varying the temperature in said vessel,

means for measuring the temperature in said vessel,

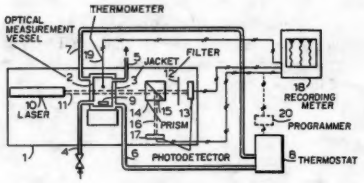
means for generating a linearly polarized beam of light,

means for transmitting said beam of light through solution contained in said measurement vessel,

first and second photodetector means for measuring light intensity of at least a portion of said beam of light,

beam-splitting means positioned in said transmitted beam of light adapted to split said transmitted beam of light into at least two portions and to direct a first portion thereof onto said first photodetector means, and a second portion thereof onto said second photodetector means,

control means adapted to receive a signal from said second



photodetector means and to responsively control said temperature varying means such that the temperature in said measurement vessel is caused to decrease when the light intensity measured by said second photodetector means remains at or above a preselected high value and is caused to increase when the light intensity measured by said second photodetector means remains at or below a preselected low value,

a light polarizing analyzer positioned in said first portion of said transmitted light between said beam-splitting means and said first photodetector means, the direction of polarization of said analyzer being normal to that of said transmitted beam of light, whereby signals from said first photodetector means and said temperature measuring means are used to determine the saturation temperature of said solution.

4,572,677

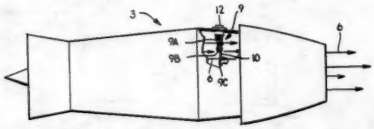
VIBRATION DAMPED PROBE

Tyag R. Sehgal, Cincinnati, Ohio, assignor to General Electric Company, Cincinnati, Ohio

Filed Jan. 30, 1984, Ser. No. 575,366

Int. Cl.[4] G01K *1/14, 13/02*

U.S. Cl. 374—144 **1 Claim**



1. An apparatus for sensing the temperature of a gas stream in a gas turbine engine, comprising:

(a) a base;

(b) a first elongated probe having a first length fastened to the base for supporting a first temperature sensor;

(c) a second elongated probe having a second length fastened to the base for supporting a second temperature sensor, the second probe being approximately one-half the length of the first probe;

(d) a first fastening means for said first and second probes through which the first probe is journaled with a clear-

ance of approximately between 2 and 5 mils and which is fastened to the second probe; and

(e) a second fastening means for said first and second probes through which the second probe is journaled with a clearance of approximately between 2 and 5 mils and which is fastened to the first probe,

wherein the only mechanical connections existing between the first and second probes are in the first and second fastening means and in the base.

4,572,678

CAGE FOR BALL BEARING, IN PARTICULAR A PLASTIC CAGE FOR A FOUR-POINT CONTACT BEARING

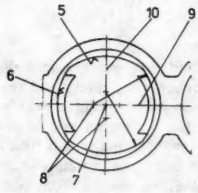
Günter Neder, Schweinfurt, and Rainer Schürger, Schwanfeld, both of Fed. Rep. of Germany, assignors to SKF Kugellagerfabriken GmbH, Schweinfurt, Fed. Rep. of Germany

Filed Oct. 3, 1984, Ser. No. 657,234

Claims priority, application Fed. Rep. of Germany, Oct. 8, 1983, 8329136[U]

Int. Cl.⁴ F16C *33/38*

U.S. Cl. 384—533 **8 Claims**



1. In a one piece elastic plastic cage for a ball bearing comprising a pair of side rings interconnected by crosspieces forming pockets for receiving balls, said pockets having center axes, each of said crosspieces having projections formed thereon for guiding and holding a ball; the improvement wherein each of said side rings is formed of thin walls and has a wavelike shape in the circumferential direction, and said crosspiece arranged between each pair of adjacent pockets are thicker in the circumferential direction than the thickness of said thin walls of said side rings and extend in the axial direction for a distance approximately equal to one-half of the axial dimension of said cage, said cage pockets at the pitch circle of said bearing comprising four separate circular cylindrical surfaces with axes parallel to the center axis of the respective cage pocket.

4,572,679

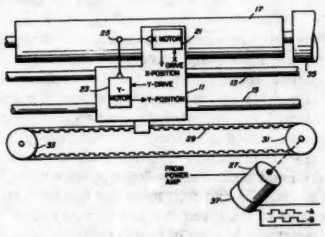
SLAVED RAMP VOLTAGE GENERATOR FOR A CALLIGRAPHIC CHARACTER PRINTER

Steve Dorr, Windham, N.H., assignor to Centronics Data Computer Corp., Hudson, N.H.

Filed Mar. 11, 1981, Ser. No. 242,660

Int. Cl.⁴ B41J *3/04*

U.S. Cl. 400—17 **5 Claims**



1. In a calligraphic character printer of the type in which a carriage transports a stylus assembly, including a pair of stylus controlling transducers, along a line of print, a slaved ramp system for writing while the carriage is moving, said system comprising:

means for driving said carriage at a selectable speed and for synchronously generating pulse signals at a rate which is proportional to carriage speed;

a digital counter which is incremented by said pulse signals;

means for resetting said counter at the start of writing each character;

a digital to analog converter interconnected with said counter to provide a voltage which varies in proportion to displacement of said carriage;

means for generating, from stored data, a pair of voltages which represent stylus position components along transverse directions relative to a fixed frame of reference;

means for summing the carriage displacement voltage with at least one of said position component voltages thereby to obtain respective control voltages for said transducers;

means for driving said transducers to effect stylus movement which is, relative to the carriage, proportional to said control voltages and which is, relative to the platen, proportional to the position voltages essentially independent of the velocity of the carriage.

4,572,680

STAMPING APPARATUS FOR PROVIDING WORKPIECES WITH DIFFERENT EMBOSSED MARKS

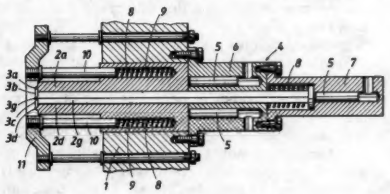
Stangl Kurt, Hauptstrasse 17a, A-4863 Seewalchen, Austria

Filed Mar. 17, 1983, Ser. No. 476,040

Claims priority, application Austria, May 10, 1982, 1812/82

Int. Cl.⁴ B41J *3/10*

U.S. Cl. 400—121 **2 Claims**



1. Apparatus for stamping embossed marks into a metal workpiece, comprising

a punch holder,

a plurality of rigid rectilinear punches juxtaposed over their entire length and axially slidably mounted in said punch holder,

a pattern segment provided on each of said punches on an end face thereof, and

a pressure fluid-operable punch actuator for axially reciprocating respective ones of said punches, wherein

said punch actuator comprises a pressure fluid source, a like plurality of cylinders operatively connected to said pressure fluid source and associated with respective ones of said punches, the cylinders being axially spaced from the respective punches, axially reciprocable pistons in said cylinders separate and independent of said punches and selectively operable to actuate the associated punches, and a controller for controlling the supply of the pressure fluid from said source to each one of said cylinders, and

said juxtaposed punches are mounted in said punch holder in such an arrangement that each punch constitutes a slide track over the entire length thereof for axially guiding an adjacent one of said punches while the pistons associated with juxtaposed ones of said punches are spaced from each other, and said pattern segments are so designed and arranged that said punches are adapted to be actuated in

any of a plurality of combinations in which said pattern segments of said actuated punches form different patterns.

4,572,681

WIRE DOT PRINT HEAD

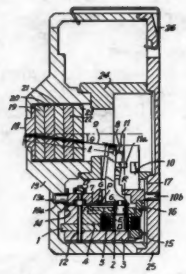
Yoshinori Miyazawa, and Shigeki Mizuno, both of Shiojiri, Japan, assignors to Epson Corporation, Tokyo, Japan

Filed Nov. 9, 1983, Ser. No. 550,275

Claims priority, application Japan, Nov. 12, 1982, 57-199437; Nov. 12, 1982, 57-199440; Nov. 15, 1982, 57-172599[U]; Nov. 22, 1982, 57-205170; Nov. 22, 1982, 57-205172; Feb. 15, 1983, 58-23059

Int. Cl.⁴ B41J *3/12*

U.S. Cl. 400—124 **12 Claims**



1. A wire dot print head having a central axis comprising:

a leaf spring;

a plunger fixed to said leaf spring;

a permanent magnet for attracting said plunger in a direction to bias said leaf spring;

a demagnetizing coil for selectively cancelling out magnetic flux from said permanent magnet when a current is passed through the coil to allow the release of said plunger from said permanent magnet to permit release of said bias on said leaf spring;

a lever affixed to said leaf spring and holding a printing wire, said leaf spring extending essentially parallel to the central axis of the print head, whereby said printing wire is displaced for printing upon the release of said bias; and

an attachment member to which said leaf spring is affixed at a position spaced from said lever, said attachment member including a portion extending along the surface of said spring facing in the direction of release of said bias of said leaf spring to a position close to the center of the effective spring portion of said leaf spring.

4,572,682

LUBRICATED UNIVERSAL JOINT

Nobuo Iwata, Sagamihara, Japan, assignor to Ricoh Company, Ltd., Japan

Filed Nov. 29, 1983, Ser. No. 556,144

Claims priority, application Japan, Nov. 29, 1982, 57-180349[U]

Int. Cl.⁴ B41J *1/24*; F16D *3/26*

U.S. Cl. 400—144.2 **10 Claims**

1. A coupling device for transmitting a driving power from a driving source to an object to be driven, comprising:

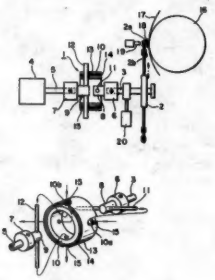
a first ring member;

first and second sliding means provided in said first ring member and spaced apart over a predetermined distance along an axial direction of said first ring member;

a first rotating shaft connectable to either one of said driving source and object and having an integrally provided first pin which is slidably fitted in said first sliding means and extends in a first radial direction of said first ring member;

a second rotating shaft connectable to the other of said driving source and object and having an integrally provided second pin which is slidably fitted in said second sliding means and extends in a second radial direction of said first ring member perpendicular to said first radial direction; and

a second ring member loosely fitted to and substantially coaxial with said first ring member with a predetermined clearance between said first and second ring members for use as a storage space for storing a quantity of lubricant to



be supplied to said first and second sliding means, said second ring member being interposed between said first and second pins so as to be kept in position.

8. A device of claim 1 wherein said object to be driven includes a print wheel including a hub fixedly mounted on either one of said first and second rotating shafts, a plurality of spokes extending radially outwardly from said hub and a plurality of type elements provided on said spokes.

4,572,683

STRUCTURE FOR MOUNTING AN INK RIBBON CASSETTE ON A PRINTER CARRIAGE

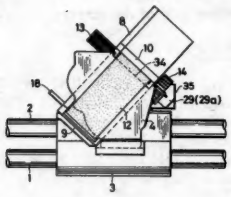
Mikio Hayashi, Tokyo, Japan, assignor to Seikosha Co., Ltd., Tokyo, Japan

Filed Dec. 23, 1983, Ser. No. 565,186

Claims priority, application Japan, Dec. 27, 1982, 57-201631[U]

Int. Cl.⁴ B41J *32/00*

U.S. Cl. 400—208 **16 Claims**



1. In combination: a printing head supporting carriage mounted to undergo movement along a given axis in a printer, and an ink ribbon cassette mountable on said carriage at an angle thereto and having a recess in which a printing head can be positioned, the improvement which comprises:

said cassette having at least one positioning pin at its bottom;

a resilient lever provided on the peripheral surface of said cassette which is substantially perpendicular to said bottom thereof, said lever having a lower end secured to said peripheral surface and a free upper end;

said carriage having at its top a first inclined surface inclined relative to the given axis and shaped and dimensioned to support said bottom of said cassette thereon and having a hole for receiving said pin therein;

said carriage having at its top a second inclined surface

which is substantially perpendicular to said first inclined surface and which is shaped and dimensioned to support said peripheral surface of said cassette thereon, said lever being releasably engageable with said second inclined surface to releasably hold said cassette on said carriage and being elastically movable for disengagement from said second inclined surface; and

a retaining member attached to said carriage for retaining said pin in said hole.

4,572,684

HEAT-SENSITIVE COLOR TRANSFER RIBBON

Tadao Sat~, Matsudo, and Yoshikazu Shimazaki, Takatsuki, both of Japan, assignors to Fuji Kagakushi Kogyo Co., Ltd., Osaka, Japan

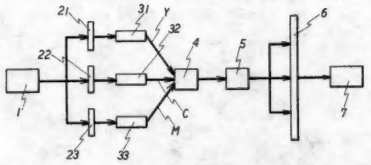
Continuation of Ser. No. 361,198, Mar. 24, 1982, abandoned, which is a continuation-in-part of Ser. No. 215,838, Dec. 12, 1980, abandoned. This application Oct. 10, 1984, Ser. No. 659,034

Claims priority, application Japan, Jan. 7, 1980, 55-678

The portion of the term of this patent subsequent to Mar. 5, 2002, has been disclaimed.

Int. Cl.⁴ B41J *3/20*

U.S. Cl. 400—240.4 **6 Claims**



1. A heat-sensitive color transfer ribbon applicable to a thermal printer in a color recording system for preparing on a copy sheet a multi-color image by means of overlaps of colors, comprising a foundation having a least three nonoverlapped heat-sensitive transfer ink layers of yellow, cyan and magenta colors on one side thereof; each of said three different color ink layers being substantially transparent and capable of transferring substantially permanently-existing overlapping portions of at least two different color ink layers and having a thickness of 1 to 10μ, a melting point of 50° C. to 150° C., a viscosity of 20 to 10,000 cP at a temperature higher than the melting point by 30° C., and a penetration of 0.1 to 50° at 25° C., and containing 1 and 20% by weight of a coloring agent, 20 to 80% by weight of a solid wax as a binder and 3 to 25% by weight of a softening agent; and said coloring agent being at least one of dyes and organic pigments, the organic pigments being those capable of coloring the transfer ink substantially transparently when dispersed into the vehicle composed of the wax and the softening agent.

4,572,685

DOT PRINTER

Yoshikane Matsumoto; Tsuneki Kobayashi; Makoto Kurosawa, and Minoru Seino, all of Ibaraki, Japan, assignors to Hitachi Koki Co., Ltd., Japan

Continuation-in-part of Ser. No. 367,518, Apr. 12, 1982, Pat. No. 4,421,430. This application Jun. 8, 1983, Ser. No. 502,354

The portion of the term of this patent subsequent to Dec. 20, 2000, has been disclaimed.

Int. Cl.⁴ B41J *25/28*

U.S. Cl. 400—320 **7 Claims**

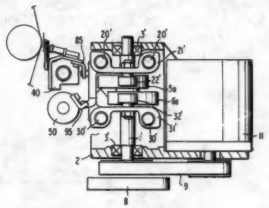
1. A dot printer, comprising:

a rotatable vertically mounted cam shaft, and means for driving said cam shaft;

first and second cams mounted on said cam shaft in a manner such that the major diameters thereof are orthogonal with one another;

a pair of first and second sliders reciprocable in opposite directions and perpendicular to said cam shaft, said first slider having means in contact with cam surfaces of said cam shaft and said second slider having means in contact with cam surfaces of said second cam on opposite sides of said cam shaft;

hammer bank means including a plurality of printing hammers, and a hammer bank coupled to said first slider so that said hammer bank is reciprocated along a printing line; and



counterweight means coupled to said second slider so that said counterweight means is reciprocated in a direction opposite the direction of reciprocation of said hammer bank, said counterweight means having a weight which is substantially equal to that of said hammer bank, wherein said hammer bank and said counterweight are coupled to said pair of sliders in a manner such that a line connecting the center of gravity of said hammer bank to the center of gravity of one of said pair of sliders and a line connecting the center of gravity of said counterweight to the center of gravity of the other slider cross one another.

4,572,686

APPARATUS FOR MAKING LABELS

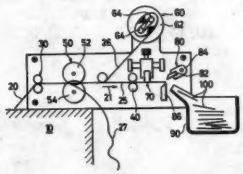
Kenmei Tanaka, Hyogo, Japan, assignor to Kanzaki Paper Mfg. Co., Ltd., Tokyo, Japan

Filed Nov. 1, 1984, Ser. No. 667,161

Claims priority, application Japan, Nov. 21, 1983, 58-220396

Int. Cl.⁴ B41F *13/58*

U.S. Cl. 400—621.1 **20 Claims**



1. An apparatus for making labels, said apparatus comprising:

means for printing label information on a continuous web of paper wherein said paper comprises a layer of label paper and a layer of transfer carbon paper, said paper including, on at least one of the label side and back side of said label paper, marks having a known relationship to the intended transverse edges of said labels;

slitting means adjacent said printing means, said slitting means being disposed to continuously trim the opposite longitudinal edges of said web;

means for driving said web through said apparatus;

means for winding said carbon paper separate from said label paper in the form of a cylindrical roll, said winding means including clutch means for compensating for the changing diameter of said roll;

means for photoelectrically detecting said marks on the label paper; and

cutting means operating in conjunction with said detecting means, said cutting means cutting said label paper into invidividual labels.

4,572,687

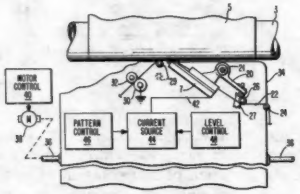
REPETITIVE MODE FOR THERMAL PRINTING LIFT-OFF CORRECTION

Donald F. Croley, Georgetown, and Stanley Dyer, Lexington, both of Ky., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jul. 31, 1984, Ser. No. 636,434

Int. Cl.[4] B41J *29/373*

U.S. Cl. 400—696 **8 Claims**



1. A thermal printer having a power source to power heat-producing elements which can be selectably activated for lift-off correction while in contact with an erase medium normally operative within a range of levels of activation of said elements comprising means to cause said printer to erase a single area of printing by traversing said area once while activating said elements for lift-off correction at a first level of activation within said range and then once while activating said elements for lift-off correction at a second level of activation within said range, said second level lower from said first level by at least five percent of said first level.

4,572,688

BALL-POINT PEN

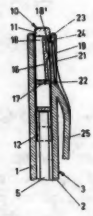
Odo Klose, Wuppertal, Fed. Rep. of Germany, assignor to Präsenta KG Weber & Co., Solingen, Fed. Rep. of Germany

Filed Jul. 18, 1983, Ser. No. 514,458

Claims priority, application Fed. Rep. of Germany, Jul. 16, 1982, 8220321[U]; Jul. 16, 1982, 8220323[U]

Int. Cl.[4] B43K *7/12, 24/04*

U.S. Cl. 401—112 **23 Claims**



1. In a ball-point pen comprising a housing which is non-round in cross-section at an upper region thereof, tapering towards a lower end thereof, a cartridge and a spring disposed about said cartridge inside of said housing and inwardly biasing said cartridge, a push button limitedly displaceable in a longitudinal direction of said housing for operatively extending said cartridge, and detent means for locking said push button in an inwardly pushed position of said push button, the improvement wherein

the housing has a substantially flat shape at said upper region,

said push button constitutes a slide plate substantially complementarily disposed in said flat shape of said upper region of said housing and substantially displaceable exclusively in said longitudinal direction of said housing and having a wide side, and forming a tongue at said wide side,

said tongue being biased resiliently springing transversely out from said wide side of said slide plate,

said tongue has a detent tooth releasably engageable with said housing, said tongue and said detent tooth comprising said detent means,

a push-button plate resiliently swingable on said housing and disposed in front of said tongue of said slide plate pressable against said tongue to release engagement of said detent tooth from said housing in said inwardly pushed position of said push button, the push-button plate being substantially parallel to said wide side of said slide plate, and

said housing forms a protection frame substantially framing said push-button plate.

4,572,689

DISPOSABLE APPLICATOR

Milton P. Chernack, 399 June Pl., West Hempstead, N.Y. 11552

Filed Mar. 28, 1983, Ser. No. 479,754

Int. Cl.[4] B43K *5/14;* A45D *40/00*

U.S. Cl. 401—132 **3 Claims**

1. A disposable applicator for nail polish or other liquid comprising:

a frangible ampul containing the liquid;

a housing defining a chamber open at one end for housing said ampul, said housing being comprised of a flexible material and an integral section at said one end defining a passage of lesser cross-section than said chamber, said housing and said chamber being of cylindrical shape, said section being of tubular shape and said passage being concentric with said chamber;

an applicator secured to said housing at said open end of said chamber, said applicator comprising a plurality of elongated bristles and a tubular retainer having a through bore, said retainer being disposed in said passage with one end of said bristles disposed between the outer surface of said retainer and the inner surface of said tubular section; and

a collar separate from said tubular secion and said retainer and disposed about said section in compressing relation thereto so that the inside surface of said passageway is compressed by said collar into sealing engagement with and to securely retain said bristles between said housing section and retainer,

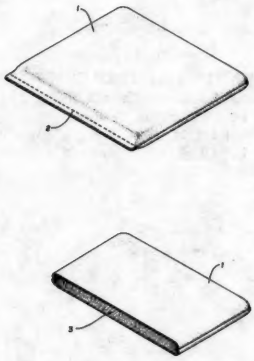
whereby said housing may be squeezed for breaking said ampul whereupon said liquid is transmitted to said applicator through said open end of said chamber and liquid flow from said chamber passes serially through said passage, through said bore and directly onto said bristles.

4,572,690

GRIPPING COMPOSITION DISPENSER AND GRIPPING COMPOSITION THEREFOR

Daniel F. Savanuck, Pikesville, Md., assignor to Chemical Specialties Manufacturing Corporation, Baltimore, Md.

Filed Feb. 3, 1984, Ser. No. 576,715
Int. Cl.⁴ A44B *13/00*
U.S. Cl. 401—200 **24 Claims**



1. A rosin bag-type device comprising:

(a) a permeable container for dispensing a grip-enhancing material; and

(b) an admixture within said permeable container, comprising a major portion by weight of a particulate friction enhancing inorganic oxide composition and a minor portion by weight of an astringent composition, said admixture being permeable through said container by manipulation of the container.

6. The device of claim **1** wherein the ratio by weight of fumed silica to aluminum chlorohydrate in from about 20:1 to about 20:5.

18. A hand-grip enhancing powder comprising, in admixture, a major portion by weight of a friction enhancing particulate inorganic oxide and a minor portion by weight of an astringent compositon.

23. The powder of claim **1** wherein the ratio by weight of fumed silica to aluminum chlorohydrate in from about 20:1 to about 20:5.

4,572,691

PEN-LIKE INSTRUMENT FOR APPLYING CORRECTION FLUID

Kenneth J. Kirchhoff, Gem Lake, and Clinton W. Lightfoot, White Bear Lake Township, Ramsey County, both of Minn., assignors to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Filed Jul. 2, 1984, Ser. No. 627,287
Int. Cl.⁴ B43K *5/16, 5/02, 7/12*
U.S. Cl. 401—214 **13 Claims**

1. A pen-like instrument comprising:

an elongate housing having a cavity opening through a first end of said housing;

a bag of thin flexible polymeric film material comprising a heat softenable inner layer within said cavity, said bag having an outlet opening at the first end of said housing;

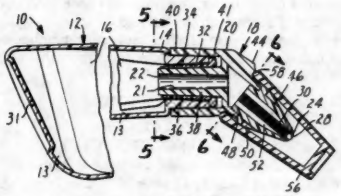
an applicator tip assembly comprising:

a body having an inlet end and an outlet end, having a through opening with an inlet in said inlet end, and including an annular inwardly projecting lip defining an outlet for said through opening in said outlet end;

an applicator member within said through opening having a surface shaped to make sealing engagement against said lip and being shaped to project through said outlet and past the outlet end of said body when said applicator member is in engagement with said lip; and

spring means for biasing said applicator member against said lip;

means for securing said body to said housing adjacent said first end and for securing the bag in liquid tight engagement to said body with the outlet opening of said bag communicating with the inlet of said through opening, said means for securing comprising a sleeve of a heat softenable material having inner and outer surfaces, and an annular outwardly projecting ridge circumferentially around said sleeve partially defining said outer surface, said sleeve being positioned within the outlet opening of said bag with said bag around said ridge and said heat softenable layer of the film fused to the outer surface of the sleeve, said housing having a portion at said first end



with a cylindrical inner surface positioned around said bag over said ridge, and said body comprising a support portion within and supporting the outer surface of said sleeve against said bag and cylindrical inner surface of said housing to provide a seal therebetween at said ridge; and

a fluid comprising an opaque coating material dispensed in a volatile solvent within said bag;

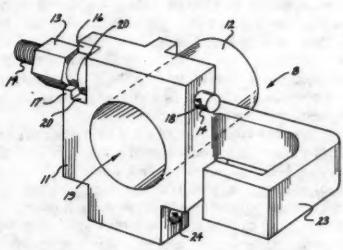
so that manual pressure applied through said housing to press the projecting portion of said applicator member against a substrate will separate said applicator member from said lip against the bias of said spring means and allow said fluid to flow from said bag around said applicator member and onto said substrate, and when such manual pressure is released the applicator member will again seal against the lip under the influence of said spring means to prevent the escape of the fluid and solvent from within the bag.

4,572,692

POSITIVE DRIVE POSITIONING COLLAR

Charles J. Sauber, 10 N. Sauber Rd., Virgil, Ill. 60182

Filed Dec. 12, 1984, Ser. No. 680,929
Int. Cl.⁴ B25G *3/00*; **F16D** *1/00*
U.S. Cl. 403—16 **7 Claims**



1. A positioning collar clamping device comprising:

a body member having a projecting portion, said member being adapted to receive a shaft through a central longitudinal opening therein;

means defining a first transverse opening through said member and overlappingly intersecting with said shaft receiving longitudinal opening;

a lock pin adapted to movably fit within said first transverse opening having first and second ends, said first end having a threaded surface and said second end being adapted to affect an interference fit with said shaft disposed within said longitudinal opening when said lock pin is moved in a first direction, while moving said pin in a second direction reduces and eliminates the interference fit;

means defining a slot at one end of said first transverse opening;

captive nut means threadably receptive of said first end of said lock pin, said captive nut means being positioned in said slot so as to be axially immovable in relation to said first transverse opening so that when said captive nut means is rotated in one direction said lock pin is positively driven in a first direction and when said captive nut means is rotated in the other direction said lock pin is positively driven in a second direction; and

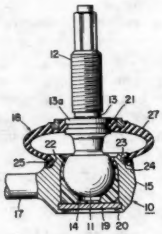
lifting hook means provided on said body member by which said collar and said shaft extending therethrough can be lifted.

4,572,693

BALL-AND-SOCKET JOINT

Akira Nemoto, Toyohashi, Japan, assignor to Musashi Seimitsu Kogyo Kabushiki Kaisha, Toyohashi, Japan

Filed Dec. 7, 1984, Ser. No. 679,312
Claims priority, application Japan, Mar. 8, 1984, 59-45086
Int. Cl.⁴ F16C *11/06*
U.S. Cl. 403—134 **4 Claims**



1. A ball-and-socket joint assembly comprising in combination:

(a) socket means having bearing means for a ball therein, said socket means having an outwardly directed peripheral groove around a socket opening thereof;

(b) a ball stud having a shank and a ball adapted to be rotatably received in said bearing means;

(c) a boot made of an elastic material with opposite ends encompassing said shank, said boot having between said ends an outwardly bulging middle trunk which has a cross section in its free state greater than the general cross section of said socket means, one end of the boot being adapted to be secured to said shank and the other end of the boot being formed as a rim adapted to fit in said peripheral groove of the socket means;

(d) a clamping ring made of an elastic material having the form of a coil wound spirally with the winding turns thereof lying adjacently side-by-side in the plane of the clamping ring each of said winding turns having substantially rectangular shape in cross section with a dimension in the axial direction of the clamping ring which is a plurality of times the dimension in the radial direction, said clamping ring being adapted to fit around said other end of the boot so as to clamp and hold firmly with elastic spring force said other end of the boot sealingly against said socket means;

(e) and the size and dimensions of the assembly being such that said clamping ring cannot be slipped over the assembly into the position for clamping and holding said other end of the boot, said bulging middle trunk of the boot being greater in diameter than the inner diameter of said clamping ring in its free state;

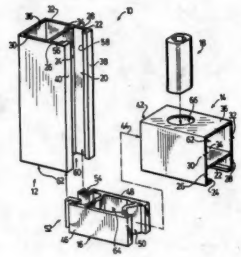
(f) and with said axial and radial dimensions and number of winding turns being chosen to reduce the degree of permanent deformation resulting from expansion over said trunk and to maintain a desired clamping force for a given greater trunk diameter.

4,572,694

STRUCTURE MEMBER CONNECTOR

Ari H. Hoeksema, Edmonton, Canada, assignor to Otto Fastening Systems Ltd., Edmonton, Canada

Filed Jul. 20, 1984, Ser. No. 632,950
Int. Cl.⁴ F16B *7/08*; F16L *41/08*
U.S. Cl. 403—187 **15 Claims**



1. A connector system for interconnecting first and second members, said first member having a slotted wall portion provided with opposing ledges which define a slot opening, said second member having an open interior with an open end for connection to said first member along said slotted wall, said second member has opposing walls with openings therein, said second member end having abutment means for abutting said ledges of said first member, a connector having a pair of spaced-apart arms interconnected at their first ends by a base and having at each extremity of the arms means for engaging a corresponding ledge of said first member with said arms extending through said slotted wall and the remainder of said connector positioned within said hollow second member, a cam extending through said openings and between said arms adjacent said connector base, said cam engaging an operative edge portion of said wall openings, said cam being configured whereby said cam in a first position as it engages said operative edge portion of said openings locates said pair of engaging means for loosely engaging said corresponding ledges of said first member and said cam when rotated to a second position as it engages said operative edge portion of said wall openings draws said ledges against said abutment means of said second member by forcing said connector base away from said operative edge portion of said openings with said engaging means engaged with said ledges, a predetermined distance of said operative edge portion being determined by the spatial relationship of said connector base to said connector engaging means and to said cam in said second position, means for stabilizing said cam in said second position to secure snugly thereby the interconnection of said first and second members, said cam having an elongate body portion which is oblong in cross-section and having major and minor axes, said cam as it extends between said connector arms projects through said openings which are automatically aligned by being positioned said predetermined distance from said second member end, said oblong cross-section of said cam providing said first position with said minor axis extending in the same direction as the longitudinal axis of said second member and providing said second position

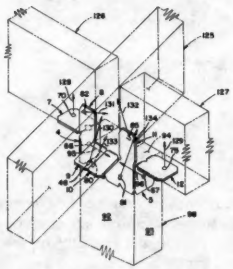
with said major axis extending in the same direction as the longitudinal axis of said second member.

4,572,695

SIX FINGER WOOD JOINTING CONNECTOR

Tyrell T. Gilb, Berkeley, Calif., assignor to Simpson Strong-Tie Company, Inc., San Leandro, Calif.

Filed Aug. 20, 1984, Ser. No. 642,382
Int. Cl.[4] F16B *15/00*
U.S. Cl. 403—232.1 6 Claims



1. A sheet metal jointing connector for joining wood framing members comprising:

a. a generally rectangular planar blank member;

b. said blank member includes an elongated palm member having a width substantially greater than its length, subdivided into an elongated mid-palm member and first and sixth palm portions formed on opposite sides of said mid-palm member;

c. said blank member also includes a multiple finger portion extending from said palm member and subdivided into first, second, third, fourth, fifth and sixth separate elongated generally parallel finger members each defined by edge border lines;

d. finger bend line means for forming a plurality of generally straight and generally aligned finger bend lines at the juncture of each of said finger members and said palm member;

e. first palm bend line means formed in said palm area delineating said first palm portion permitting bending along a first palm bend line in alignment with said edge border lines between said first and second fingers;

f. fifth palm bend line means formed in said palm member delineating said sixth palm portion along a fifth palm bend line in alignment with said edge border lines between said fifth and sixth finger members; and

g. said palm member and each of said finger members are formed with fastener openings therethrough.

4,572,696

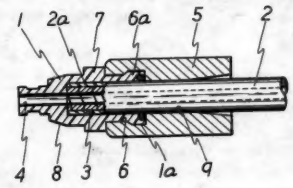
WEIGHTED CABLE CAP

Toyohiko Morikawa, Takarazuka, Japan, assignor to Nippon Cable System Inc., Hyogo, Japan

Filed Sep. 14, 1982, Ser. No. 418,036
Claims priority, application Japan, Jun. 24, 1982, 57-109263
Int. Cl.[4] B25G *3/34*
U.S. Cl. 403—265 8 Claims

1. A weighted cable cap in combination with a control cable which includes an outer casing and an inner cable therein, said weighted cable cap comprising

(A) a cable cap provided on one end thereof with a hole-W for inserting the outer casing, said hole-W having a bottom, and on the other end thereof with a hole-X for inserting the inner cable; said hole-X being perforated through said bottom so that said hole-W and hole-X are concentrically located with respect to each other, said cable cap being molded onto said outer casing; and



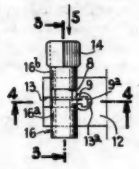
(B) a weight having a hole-Y for inserting said outer casing and having means for fixing said weight onto one end of said cable cap so that said hole-W and hole-Y are concentrically located with respect to each other.

4,572,697

COUPLING COLLAR PRODUCED BY A BLANKING AND FOLDING OF A BLANK

Bernard Haldric, Vendome, France, assignor to NACAM, Vendome, France

Filed May 25, 1983, Ser. No. 497,826
Claims priority, application France, May 28, 1982, 82 09378
Int. Cl.[4] B25G *3/00;* F16D *1/00*
U.S. Cl. 403—344 7 Claims



1. A coupling collar structure comprising a body defining a passage for an element to be coupled by the collar, means for clamping said collar on said element, and a lateral tongue portion constituting means for immobilizing said collar axially and as concerns rotation relative to said element to be coupled,

said collar comprising two parallel wings defining orifices for the passage of said element to be coupled, an intermediate portion which interconnects the two wings and defines a slot interconnecting said orifices and constituting a passage for a clamping bolt which is part of said clamping means,

said collar being formed from a blank of sheet material by folding said blank, said orifices and said slot interconnecting the orifices being punched in said blank, said lateral tongue portion being formed by a press operation on the blank and defined by a notch formed in a periphery of one of said orifices and by said slot interconnecting said orifices.

4,572,698

KEY STOP FOR A MARINE PROPELLER SHAFT

George W. Rauch, Longboat Key, Fla., assignor to General Propeller Company, Bradenton, Fla.

Filed Feb. 10, 1984, Ser. No. 578,827
Int. Cl.[4] B25G *3/28;* F16B *3/00*
U.S. Cl. 403—356 6 Claims

1. A tapered marine propeller shaft and key apparatus comprising:

a shaft for use in driving a propeller to obtain thrust for propelling a boat in water, said shaft having an aft end

portion and a tapered portion adjacent from said aft end portion;

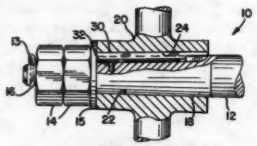
said aft end portion being threaded to accept a nut;

a propeller hub having a tapered interior hub portion;

said shaft tapered portion being matable with said hub tapered portion;

an axial keyway in each of said tapered portions, including a first keyway in said hub portion extending through at least the fore propeller side, and a second keyway in said shaft tapered portion extending through at least said threaded aft end portion;

said second keyway having a radial bore;



a key having a pin extending from one surface of said key normal to the longitudinal axis of said key;

said pin being located on said key for insertion into said bore on positioning said key in said keyway;

means on the key accommodating a certain accumulation of dirt in the keyway while still providing a tight fit of the key;

said hub portion being mounted on said shaft and locked in place by locking nut means on said threaded aft end portion, said pin thereby precluding movement of said key in both fore and aft axial directions in said keyway while maintaining facility in the assembly of said shaft and key apparatus.

4,572,699

PAVING STONE

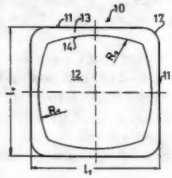
Hans J. Rinninger, Kisslegg, Fed. Rep. of Germany, assignor to Hans Rinninger u. Sohn GmbH u. Co., Kisslegg, Fed. Rep. of Germany

Filed Dec. 16, 1983, Ser. No. 562,405

Claims priority, application Fed. Rep. of Germany, Dec. 18, 1982, 8235649[U]; Jun. 20, 1983, 3322090; Jul. 26, 1983, 3326846

Int. Cl.[4] E01C *5/00*

U.S. Cl. 404—42 **12 Claims**



1. A paving stone, especially a concrete paving stone, for the paving of gardens and parks, paths or the like, wherein all side surfaces **(11)** of the paving stone **(10, 15, 16, 18** to **21, 30, 31)** are designed as plane surfaces, and wherein the transitional surface **(13)** between the side surfaces **(11)** and an upper surface **(12)** of the paving stone is rounded, the paving stone further including edge regions **(17)** between the side surfaces which are strongly drawn so that a limiting line **(14)** between the transitional surface **(13)** and the upper surface **(12)** is curved when seen from above, said edge regions being rounded as seen from above.

4,572,700

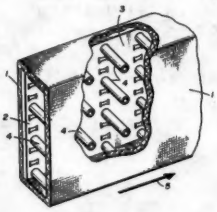
ELONGATED BENDABLE DRAINAGE MAT

Joseph Mantarro; Keh-Chang Liu, both of Pensacola, Fla., and Barry J. Dempsey, White Heath, Ill., assignors to Monsanto Company, St. Louis, Mo.

Filed Mar. 31, 1983, Ser. No. 480,990

Int. Cl.[4] E01C *9/08, 11/10*

U.S. Cl. 404—35 **13 Claims**



1. An elongated bendable drainage mat having a rectangular transverse cross-section, said drainage mat comprising:

a polymeric core having a plurality of substantially rigid fingers extending from one side of a layer and an enveloping water permeable fabric, wherein said fabric has a permittivity from 0.2 seconds^{-1} to 2.0 seconds^{-1} and exhibits a dynamic permeability after 10^6 loadings of at least 10^{-4} centimeters per second, such that said mat is resistant to soil pluggage from pulsing water flow.

4,572,701

UNIVERSAL CONCRETE SCREED SYSTEM

Albert Parsons, and H. Norris Havens, both of Columbia, S.C., assignors to Consolidated Systems, Inc., Columbia, S.C.

Filed Sep. 23, 1983, Ser. No. 535,112

The portion of the term of this patent subsequent to Jan. 31, 2001, has been disclaimed.

Int. Cl.[4] E01C *11/02*

U.S. Cl. 404—50 **31 Claims**

7. In a generally flat elongated screed stake having a flat top, a pointed bottom, a central longitudinal stiffening bead, and a plurality of upwardly pointing fingers formed from the metal of the stake laterally of the stiffening bead, the improvement wherein each of the fingers is formed by a generally upwardly and outwardly extending portion integral with the stake and a generally upwardly and inwardly extending terminal portion.

31. A method of securing screed to a stake comprising the steps of:

(a) providing an elongated screed having substantially coplanar upper and lower portions and a longitudinal channel therebetween, said channel extending into a first side thereof and protruding out of the second side thereof, a surface spaced from and facing the upper portion of the screed on the first side thereof, and a skirt-depending from the lower portion;

(b) providing an upright stake with a flat top, a pointed bottom, a longitudinal stiffening bead extending into a first side thereof and protruding from a second side thereof, and a surface spaced from and facing the first side thereof; and

(c) positioning the screed relative to the stake:

(1) with the second side of the stake in contact with the surface of the screed,

(2) with the first side of the stake in contact with the upper portion, the lower portion and the free end of the skirt of the screed, all on the first side thereof, and

(3) with the second surface of the screed in contact with the surface of the stake,

the above points of contact being sufficiently offset from the plane passing approximately therethrough to stress the stake and screed within their elastic limits sufficiently to secure the screed to the stake.

4,572,702

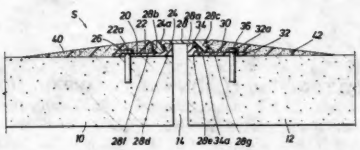
EXPANSION JOINT

John M. Bone, 2534 Palo Pinto, Houston, Tex. 77080

Filed Feb. 27, 1984, Ser. No. 583,761

Int. Cl.⁴ E01C *11/10*

U.S. Cl. 404—65 **1 Claim**



1. An expansion joint adapted for sealing an elongated gap formed between two adjacent road sections while providing a continuous support for the vehicle tires, including:

a first non-metallic mounting strip mountable with one of the road sections adjacent the elongated gap said first mounting strip having a base with a securing ridge formed thereon, said securing ridge forming a locking surface facing away from the gap;

a means with said first mounting strip for securing said first mounting strip to the one road section at a desired location adjacent the gap and extending substantially the length of the gap;

a second non-metallic mounting strip mountable with the other of the two road sections adjacent said elongated gap, said second mounting strip having a base with a securing ridge formed thereon, said securing ridge of said second mounting strip forming a locking surface facing away from the gap;

means with said second mounting strip for securing said second mounting strip to the other of the two road sections adjacent said elongated gap at a predetermined distance from said first mounting strip and extending substantially the length of the gap; and

a seal strip secured to said first mounting strip and said second mounting strip for sealing between said first and said second mounting strip to block passage of undesired matter into the gap, said seal strip adhesively bonded to each of said mounting strips along substantially the entire length of said seal strip, said seal strip having a central web connecting a pair of parallel attachment ribs, each said attachment rib having an interior surface facing toward said other attachment rib and an exterior surface facing away from said attachment rib,

said first locking surface of said first mounting strip and one of said interior surface on said seal strip having interengageable locking projections and grooves for mechanically locking said seal strip with said first mounting strip; and

said second locking surface of said second mounting strip and one of said interior surface on said seal strip having interengageable locking projections and grooves for mechanically locking said seal strip with said second mounting strip;

said exterior surface of said attachment rib having a plurality of projections and grooves formed thereon; and

a body of epoxy mortar cast adjacent said exterior surface of said rib for preventing disengagement of the interior surface of said attachment rib and for providing a continuous transition roadway from the road section to said seal strip for the vehicle tires.

4,572,703

APPARATUS FOR APPLYING TO A ROAD, RUN-WAY OR EQUIVALENT A POINT-FORMED OR DOTTED PAINT OR MARKING, ESPECIALLY A TRAFFIC INDICATION LINE

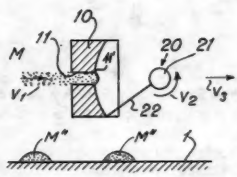
Jens Gert K. Moller, Hurup, Denmark, assignor to Superros Dammann-Luxol A/S, Frydenlundsvej, Vedbaek, Denmark

Filed Dec. 19, 1984, Ser. No. 683,414

Claims priority, application Denmark, Jan. 9, 1984, 76/84

Int. Cl.⁴ E01C *23/16*

U.S. Cl. 404—94 **4 Claims**



1. Apparatus for applying blobs of viscous marking liquid to a ground surface comprising a wheeled vehicle adapted to traverse the surface, the vehicle including a reservoir for the marking liquid with a liquid outlet, pressure means for continuously forcing liquid from the reservoir through the outlet, and liquid flinging means externally of the reservoir for applying intermittent propelling forces to liquid issuing from the outlet for repetitively shearing blobs of material from the liquid and flinging the blobs onto said surface.

4. The invention of claim 1 wherein the outlet and flinging means are replicated across the width of the vehicle.

4,572,704

HIGH DENSITY CONCRETE PLACING AND FINISHING MACHINE

J. Dewayne Allen, Paragould, Ark., assignor to Allen Engineering Corporation, Paragould, Ark.

Continuation-in-part of Ser. No. 457,727, Jan. 13, 1983, Pat. No. 4,466,757. This application Feb. 16, 1984, Ser. No. 580,899

The portion of the term of this patent subsequent to Aug. 21, 2001, has been disclaimed.

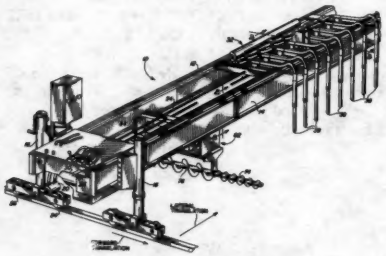
Int. Cl.⁴ E01C *19/29*

U.S. Cl. 404—114 **23 Claims**

1. Apparatus for partially finishing an area of plastic concrete having an irregular upper surface, comprising:

a. bridge means spanning the width of the plastic concrete surface;

b. support means for maintaining said bridge means in a plane substantially parallel to the plastic concrete surface;
c. means for translating said bridge means along the length of said concrete surface;
d. levelling means coupled to and laterally translatable along the length of said bridge means within a linear segment of said plastic concrete for levelling the irregular upper surface of said concrete to form a flat intermediate surface;
e. vibrating means coupled to said bridge means for internally vibrating said linear segment to densify said concrete and to elevate low density material within said linear segment into a surcharge layer; and
f. first auger means coupled to and laterally transluatable along the length of said bridge means within said linear segment for engaging said plastic concrete at a level below said flat intermediate surface to thereby remove and displace said surcharge layer of concrete forward and out of said linear segment, wherein said levelling means and said first auger means are coupled to a carriage laterally translatable with respect to said bridge means.



19. A method for partially finishing an area of plastic concrete having an irregular upper surface, comprising the steps of:
a. supporting bridge means above and substantially parallel to the plastic concrete surface;
b. levelling a linear segment of said concrete surface to form a flat intermediate surface by laterally translating first levelling means across said bridge means, wherein said levelling means is maintained at a first reference elevation below said bridge means;
c. internally vibrating the concrete within said linear segment to densify said concrete and to elevate low density material within said linear segement into a surcharge layer; and
d. engaging said concrete within said linear segment at a level below said intermediate surface with second levelling means maintained at a second reference elevation below said bridge means and said first reference elevation and displacing said surcharge layer forward and out of said linear segment to permit said surcharge layer to be remixed with said plastic concrete by said first levelling means.

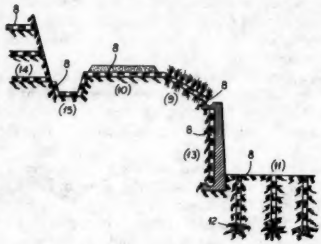
4,572,705

REVETMENT OF CELLULAR TEXTILE MATERIAL

Jean F. B. J. Vignon, 16, quai des Moulins, Sète 34200, and Christian Tabouy, 6, rue des Tilleuls, 34970 Lattes, both of France

Filed May 27, 1980, Ser. No. 153,826
Int. Cl.[4] E02B *3/12;* E02D *17/20*
U.S. Cl. 405—16 **3 Claims**

1. A revetment for stabilizing a ground structure, comprising:
a grid layer formed by porous planar continuous textile-fiber strips of non-decomposable material joined together at spaced-apart locations to define open pockets of regular hexagonal shape between said strips which are open on opposite sides of said layer, said strips being of uniform thickness over their entire lengths; and



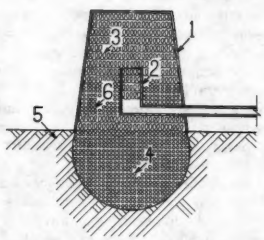
porous mineral matter filling said pockets, each of said strips having its transverse width perpendicular to the plane of said layer and uniform over its entire length whereby the thickness of said layer is equal to the width of said strips.

4,572,706

DESALTING IRRIGATION AND ITS APPARATUS

Yasuo Tsuruta, 22-2, 4-chome, Sanno, Ota-ku, Tokyo, Japan

Continuation-in-part of Ser. No. 147,229, May 6, 1980, abandoned. This application Mar. 18, 1982, Ser. No. 359,492
Int. Cl.[4] A01G *27/00;* E02B *13/00*
U.S. Cl. 405—36 **7 Claims**



1. A method of irrigating a plant from a top surface of soil in which the plant is growing, comprising very slowly infusing water into the soil to a root region of the plant from an air-tight casing having an open bottom essentially sealed to the top surface of the soil, said infusing comprising infusing the water into the soil through a filler material within the casing from an upwardly opening outlet of a water supply receptacle in the casing, supplying water to the receptacle from a water source below the level of said upwardly opening outlet, placing a salt absorbing material between the outlet and the root region of the plant, passing the infusing water through the salt absorbing material between the outlet and the root region of the plant at a rate sufficiently low to remove salt from the infusing water and to prevent leaching of salt from the salt absorbing material.

4,572,707

METHOD IN THE EXCAVATION OF UNDERGROUND CAVERNS IN ROCK

Ivar K. Sagefors, Stockholm, Sweden, assignor to Boliden Aktiebolag, Stockholm, Sweden

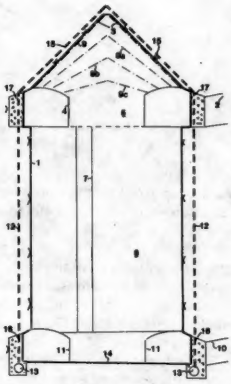
PCT No. PCT/SE84/00001, § 371 Date Jul. 24, 1984, § 102(e) Date Jul. 24, 1984, PCT Pub. No. WO84/02741, PCT Pub. Date Jul. 19, 1984

PCT Filed Jan. 9, 1984, Ser. No. 638,465

Claims priority, application Sweden, Jan. 4, 1983, 8300185

Int. Cl.[4] B65G *5/00;* E21D *13/02*

U.S. Cl. 405—55 5 Claims



1. A method in the excavations of caverns in rock, and in particular in the excavation of substantially vertical cylindrical caverns, in which fluids and other oil products, dry products and processing equipment can be stored, characterised by forming from a transport tunnel (2) an upper circumferentially extending chamber (4) having an outer diameter which is greater than the diameter of the substantially cylindrical part of the ultimate rock cavern (1), at a level located adjacent the base of the roof structure of said ultimate rock cavern; forming a lower circumferentially extending chamber (11) having an outer diameter which is greater than the diameter of the substantially cylindrical part of said ultimate rock cavern (1); drilling vertical holes (12) between said chambers (4, 11), in a region immediately outside the ultimate substantially cylindrical rock cavern (1), for draining water from said region; and forming the substantially cylindrical rock cavern between said upper and said lower chambers (4, 11) in a manner known per se.

4,572,708

EXPANSIBLE WALL PLUG

Artur Fischer, Weinhalde 34, 7244 Waldachtal 3/Tumlingen, Fed. Rep. of Germany

Filed Jan. 17, 1984, Ser. No. 571,517

Claims priority, application Fed. Rep. of Germany, Jan. 18, 1983, 3301389

Int. Cl.[4] F16B *13/06*

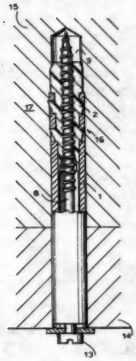
U.S. Cl. 411—22 6 Claims

1. An expansible wall plug for fastening an article with a fastening screw, comprising

an outer elongated metal sleeve having an expansible portion and insertable into the article to be fastened;

an inner elongated plastic body insertable into said outer elongated metal sleeve and having an expansible portion and a hollow interior so that the fastening screw can extend through said hollow interior of said inner elongated plastic body; and

means for locking said outer elongated metal sleeve with said inner elongated plastic body for preventing their relative rotation, said locking means including recesses on said outer elongated metal sleeve and projections on the periphery of said inner elongated plastic body, wherein said outer metal



sleeve has a rear end, said projections having an external surface that faces said rear end of said outer metal sleeve and is chamfered to form a saw-tooth shape so as to allow for simpler insertion of said inner elongated metal sleeve.

4,572,709

CONTROL APPARATUS

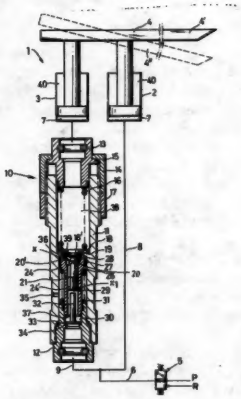
Walter Weirich, Dortmund, and Michael Dettmers, Kamen, both of Fed. Rep. of Germany, assignors to Gewerkschaft Eisenhütte Westfalia, Lünen, Fed. Rep. of Germany

Filed Apr. 4, 1983, Ser. No. 481,964

Claims priority, application Fed. Rep. of Germany, Apr. 6, 1982, 3212747

Int. Cl.[4] E21D *15/44*

U.S. Cl. 405—302 31 Claims



30. A mining installation comprising:

(a) first and second hydraulic rams, a hydraulic pressure line, and control apparatus for controlling the working stroke of the first and second hydralic rams,

(b) the first hydraulic ram being operable in response to the hydraulic pressure in said hydraulic pressure line reaching a first predetermined pressure,

(c) the second hydraulic ram being operable in response to

the hydraulic pressure in said hydraulic pressure line reaching a second predetermined pressure,

(d) the second predetermined pressure being higher than the first predetermined pressure,

(e) the control apparatus including a sequence valve and a control valve having an input side and an output side;

(f) the input side of the control valve being connected to the hydraulic pressure line, and

(g) the output side of the control valve being connected to a working chamber of each of the hydraulic rams via a respective supply line,

(h) the sequence valve being positioned in the supply line leading to the first hydraulic ram,

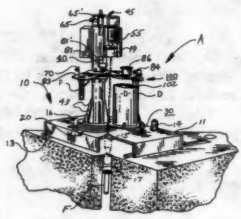
(i) the sequence valve including means for opening the associated supply line in response to the hydraulic pressure in said hydraulic pressure line reaching a valve substantially equal to the second predetermined pressure, whereby the first and second hydraulic rams operate substantially simultaneously.

4,572,710

METHOD AND APPARATUS FOR CHANGING FILTERS IN NUCLEAR POWER STATIONS

Arthur J. Stock, Stuart, Fla.; Donald E. Christofer, Mentor, Ohio; John C. Homer; Robert J. Torok, both of Chardon, Ohio, and Thomas Whittington, Mentor-on-the-Lake, Ohio, assignors to General Signal Corporation, Stamford, Conn.

Filed Jun. 14, 1982, Ser. No. 388,109
Int. Cl.⁴ G21C *19/00*
U.S. Cl. 414—146 **10 Claims**



1. Remotely controlled apparatus for removing filters from and replacing filters in a filter recess comprising:

a base adapted to be located adjacent said recess;

hoist means mounted on said base and including:

a generally vertical mast,

a generally horizontal boom extending outwardly from the top of said mast,

grab means for engaging loads including filters to be transported to and from said filter recess,

means for operating said grab means from a remote location,

lift means for supporting said grab means from said boom, and for raising and lowering said grab means in a vertical path, and

means for operating said lift means from a remote location;

a drum table mounted on said base for rotary movement relative to said base about a vertical axis spaced from said vertical path to and from a position wherein a storage drum carried thereby is placed in said vertical path;

means for operating said drum table from a remote location;

a turret mounted on said mast intermediate said base and said boom for horizontal movement about a vertical axis and having at least one radially extending arm adapted to be moved to and from a position aligned with said vertical path; and

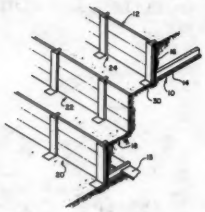
means for operating said turret from a remote location.

4,572,711

PRESTRESSED COMPONENT RETAINING WALL SYSTEM

Cade L. Benson, Parker, Colo., and John W. Babcock, Huntsville, Utah, assignors to Stresswall International, Inc., Denver, Colo.

Filed May 23, 1983, Ser. No. 496,857
Int. Cl.⁴ E02D *29/02*
U.S. Cl. 405—286 **10 Claims**



1. A modular retaining wall system which can be transported in incremental pieces and assembled at an installation location comprising:

precast prestressed wall segment means having a load carrying capacity sufficient to withstand transverse forces from backfill retained by said prestressed wall segments;

separate precast column member means for supporting said prestressed wall segment means in response to said transverse forces from said backfill, said modular column member means formed from precast concrete Tee beam forms such that said column member means have base portions and leg portions adjoining said base portions at a substantially normal angle and substantially centered on said base portion;

separate precast base member means formed from precast concrete Tee beam forms such that said base member means have base portions and leg portions adjoining said base portions at a substantially normal angle and substantially centered on said base portions, said base portions extending beyond said leg portions in a lengthwise direction by a predetermined distance to form foot portions having surface areas sufficiently large to reduce bearing pressures on soil below said foot portions to meet design limits and extending in a transverse direction a predetermined distance to form flanges, said leg portions of said precast base member means and said flanges having a surface area which engages sufficient backfill to produce resisting forces which, in combination with the weight of said base members means, are sufficient to overcome overturning moment forces produced by said backfill;

first post-tensioning means for joining said separate precast base member means and said separate precast column member means at a substantially normal angle and imparting increased strength to said base member means, said first post-tensioning means disposed through said leg portions of said column member means and said foot portions of said base member means such that said column member means rests on said foot portions of said base member means;

second post-tensioning means disposed through said leg portions of said base member means and said leg portions and said base portions of said column member means for coupling said leg portions of said base member means and said column member means together to form web portions between said base member means and said column member means which provides sufficient stability to forces produced by said backfill on said base member means and said column member means to form a unitary structure having sufficient strength to withstand bending moment forces, and for imparting increased strength to said column member means;

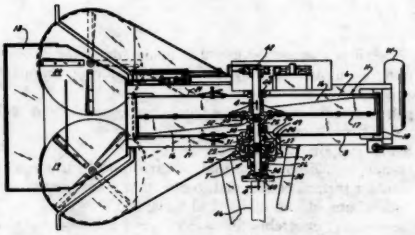
whereby said increased strength of said base member means imparted by said first post-tensioning means and said increased strength of said column member means imparted by said increased strength of said second post-tensioning means and said wall segment means imparted by prestressing reduces the size and weight of said base member means, said column member means and said wall segment means for greater ease in handling and transporting.

4,572,712

FORAGE BLOWER HAVING POWER TRANSMISSION AND MOUNTING ARRANGEMENT THEREFOR

Dean E. Seefeld, West Bend, Wis., assignor to Gehl Company, West Bend, Wis.

Filed Jul. 5, 1984, Ser. No. 627,753
Int. Cl.[4] B65G *53/58*
U.S. Cl. 406—101 **4 Claims**



1. A forage blower having vertically positioned blower housing of generally circular shape when viewed in elevation and which has a generally tangentially extending blower outlet pipe extending upwardly from said housing,

a pair of generally circular and laterally spaced apart side sheets, an annular peripheral rim sheet mounted around the periphery of said sheets, a blower fan wheel rotatably journalled in said housing for conveying forage, said fan wheel having a shaft extending from one side thereof and mounted in a bearing in one of said side sheets, said fan wheel having a central hub member, and a transmission unit secured to the other side sheet and connectible with said fan wheel for driving engagement therewith, said transmission unit including a casing having oposite sides, means for selectively securing either one of said sides to said other side sheet, a second shaft, said second shaft being rotatably journalled on anti-friction bearings within said transmission unit and having an outer end extending therefrom and connected to said fan wheel, a third shaft rotatable in said transmission unit, said third shaft having an outer end extending from said transmission unit, whereby said outer end of said third shaft can be driven by a power source, said transmission unit being reversible end for end whereby the outer end of either of said second or third shafts can be drivingly connected with said fan wheel shaft while the other of said shafts is connected in driving relationship with a power source.

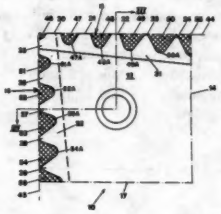
4,572,713

CUTTING INSERT FOR THREAD CUTTING

Erik Schmidt, Ludvika, Sweden, assignor to Seco Tools AB, Fagersta, Sweden

Filed Feb. 16, 1984, Ser. No. 580,750
Claims priority, application Sweden, Feb. 21, 1983, 8300933
Int. Cl.[4] B23G *5/00*
U.S. Cl. 407—114 **5 Claims**

1. A cutting insert for thread cutting comprising parallel first and second side surfaces and at least four edge surfaces extending therebetween, first and second ones of said edge surfaces intersecting and defining first supporting edges adapted to rest against supporting surface means on an insert-carrier, third and fourth ones of said edge surfaces intersecting at a corner of the insert and provided with cutting teeth, a rake face for the cutting teeth on said third edge surface being provided on said first side surface and a rake face for the cutting teeth on said fourth edge surface being provided on said second side surface so that the cutting teeth on the one of said third and fourth edge surfaces which is inactive during cutting by means of the



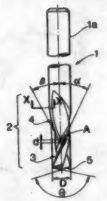
other of said third and fourth edge surfaces can be brought into cutting position by turning the cutting insert about an imaginary symmetry line which bisects an angle formed by said third and fourth edge surfaces, said teeth being separated by recesses which become progressively deeper as said recesses become more remote from said corner, said recesses including bottoms which become located progressively closer to the opposing one of said supporting edges as said recesses become more remote from said corner.

4,572,714

ROUTER BIT

Takashi Suzuki; Ryohei Fukuda, both of Utsunomiya, and Kouji Takahashi, Mibumachi, all of Japan, assignors to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 332,045, Dec. 18, 1981, abandoned.
This application Aug. 24, 1984, Ser. No. 644,149
Claims priority, application Japan, Dec. 24, 1980, 55-183174; Dec. 24, 1980, 55-183175
Int. Cl.[4] B23B *51/00*; B26D *1/12*
U.S. Cl. 408—230 **2 Claims**



1. A router bit adapted for drilling a material comprising a shank, and

a fluted portion extending from the shank,

said fluted portion comprising at least two upper continous cutting edges higher than a predetermined circumferential standard line on said fluted portion and at least one of said upper continuous cutting edges extending lower than said standard line and at least two lower continuous cutting edges lower than said standard line and at least one of said lower continuous cutting edges extending higher than said standard line,

said upper and lower continuous cutting edges form helixes which are twisted in opposite directions relative to each other so as when rotated to produce force components on the material toward said standard line,

said upper and lower continuous cutting edges overlap in a limited overlapping range at the standard line less than the entire axial lengths of said cutting edges, said overlapping range being substantially less than the length of said fluted portion,

the axial length of the overlapping range being less than 1/10 of the outermost diameter of said fluted portion, and

said fluted portion being formed with cutter edges on a point of said bit for drilling the material, and wherein

helix angles of one of said upper and lower continuous cutting edges respectively are different in absolute angle so as when rotated the cutting edges having the larger of said helix angles produce a greater force component on the material toward said standard line than the cutting edges having the smaller of said helix angles.

4,572,715

DRILLING AND MILLING GUIDE FOR ACCOMMODATING INTERCHANGEABLE POWER TOOLS

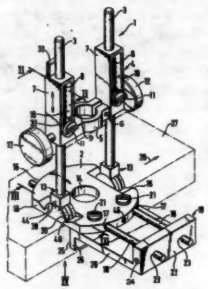
Robert Wolff, Im Kiesacker 12, 5446 Engeln, Fed. Rep. of Germany

Filed Jul. 2, 1984, Ser. No. 626,994

Claims priority, application Fed. Rep. of Germany, Dec. 2, 1983, 3343683

Int. Cl.[4] B23B *45/00*; B23C *1/20*; B27C *5/10*

U.S. Cl. 409—180 **22 Claims**



1. A drilling and milling guide for interchangeably accommodating power tools, the guide comprising a bottom plate, a pair of spaced parallel guide columns, means for pivotally mounting the guide columns on the bottom plate, a machine support means displaceably mounted on said guide columns, a pair of vertically extending lug means provided at said machine support means and mounted on said guide columns, each of the lug means includes a chamber means and each of the guide columns passes through a respective one of said chamber means, a pair of spring means for normally urging the machine support means in a direction away from the bottom plate, each of the spring means are respectively mounted within one of said chamber means, a first end of each of the spring means abutting a first portion of the respective chamber means, a pair of abutment means interposed between a second end of each of said spring means and an opposite portion of the chamber means and displaceably mounted on said guide columns, means for enabling a fixing of the abutment means at an adjusted position along the guide columns, and an opening provided in a central area of the bottom plate for accommodating a tool.

4,572,716

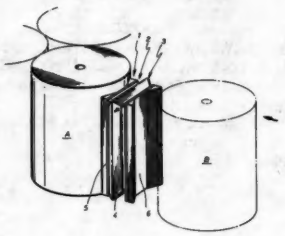
PAPERBOARD SHIPPING CHOCK AND ASSEMBLY

Kenneth O. West, Escanaba, Mich., assignor to The Mead Corporation, Dayton, Ohio

Continuation-in-part of Ser. No. 426,859, Sep. 29, 1982, abandoned. This application Dec. 17, 1984, Ser. No. 682,062

Int. Cl.[4] B61D *45/00*

U.S. Cl. 410—36 **9 Claims**



1. A shipping assembly useful in maintaining the relative position of substantially cylindrical units during shipment, comprising:

a pair of chocks in opposed relationship to each other, each said chock comprising

a planar support surface, and

a contact surface opposite said planar support surface, said contact surface conformed to effectively engage the surface of one of said cylindrical units; and

a separately insertable inflatable member between said chocks, said separately insertable inflatable member being positioned to contact opposed planar support surfaces of said pair of chocks to exert a force upon said pair of chocks and upon said cylindrical units.

8. A method of bracing between two substantially cylindrical units during shipment, comprising:

placing a first chock against one of two proximate cylindrical units and placing a second chock against a second of said two cylindrical units, said pair of chocks placed in opposed relationship to one another, each said chock comprising, a planar support surface and a contact surface opposite said planar support surface, said contact surface conformed to engage the surface of one of said cylindrical units;

inserting a separate inflatable member between said chocks; and

inflating said separate inserted inflatable member to cause said inflatable member to contact opposed planar surfaces of said pair of chocks to exert a force upon said pair of chocks and upon said cylindrical units.

4,572,717

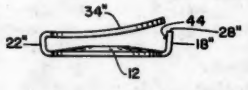
TENSION INDICATING WASHER IMPROVEMENTS

Edwin G. Swick, Bartlett, Ill., and Jerold M. Forsberg, Washington, D.C., assignors to Illinois Tool Works Inc., Chicago, Ill.

Filed Aug. 4, 1983, Ser. No. 520,279

Int. Cl.[4] F16B *31/02*

U.S. Cl. 411—11 **2 Claims**



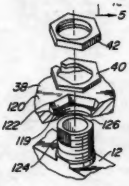
1. A tension indicating washer for indicating the loss of a predetermined measure of tension in a bolt comprising, a

spring washer having a centrally disposed aperture for receiving a bolt therethrough and indicating means providing for visual as well as manual indication of the presence of said predetermined amount of tension in said bolt, said indicating means including axially disposed reference member extending from proximate a margin of said washer and arm member cooperating with said reference member for indicating in a first position a predetermined measure of the amount of tension in the bolt and in a second position a tension less than said predetermined measure, said arm member including first and second portions wherein said second portion is supported axially from said washer by attachment of one end of said first portion proximate to the outer margin of said washer opposite said reference member, said second portion having a free end biased generally away from said washer wherein said free end is spaced from said reference member in a predetermined manner, at least one of said free end and said reference member including cooperable means for manually latching said free end of said second portion relative to said reference member when said bolt is tensioned a predetermined amount, whereby as force is applied to the washer by increased tension in the bolt the washer generally deflects towards a planar condition causing the end of said second portion to move in a predetermined manner to enable it to be manually manipulated into a predetermined latch position relative to said reference member and whereby when said tension in said bolt is less than said predetermined amount said free end will be released from said latched condition to indicate that the measure of tension in said bolt has fallen below said predetermined amount.

4,572,718
ANTI-ROTATION LOCKING ASSEMBLY

Stanley J. Stevens, Atco, N.J., and Jeffrey G. Hoffman, Hatfield, Pa., assignors to General Signal Corporation, Stamford, Conn.

Filed Mar. 29, 1984, Ser. No. 594,586
Int. Cl.⁴ F16B *39/00*
U.S. Cl. 411—107 **5 Claims**



1. An anti-rotation locking assembly for preventing rotation of a housing member with respect to a threaded body to which the housing member is threadably mounted when the housing has a threaded hole in the housing surface to be mounted so that said hole may threadably accept the threaded body and allow said threaded body to be threaded through said surface so as to extend beyond said housing surface for a sufficient length to accept a nut for locking said surface with respect to said threaded body, comprising:

two opposing flat relief surfaces on said threaded body in that region of the threaded body extending beyond said housing surface when threaded engagement between the housing surface and said body is complete;

a tapered sided recess in said surface around said hole, said recess having a non-circular profile in the plane of said surface;

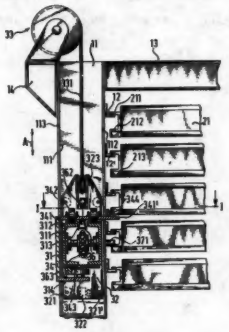
a straight sided c-ring having a profile matching that of said recess with outer dimensions which cause its periphery to engage said tapered sides, said ring also having a central opening which will allow the ring to slip over said threaded body and engage said relief surface; and

a nut threaded on said threaded body over said ring to press said straight sided ring into said tapered recess to first cause elastic deformation of the ring so that the central opening of the ring closes to grip said relief surfaces and then to cause said ring to plastically deform the sides of said recess as the straight sides of said ring bite into the tapered sides of said recess upon tightening of said nut.

4,572,719
DEVICE FOR STORING PALLETS AND REMOVING THEM FROM STORAGE

Adolf Theobald, Merchstrasse 5, D-5758 Fröndenberg-Warmen, Fed. Rep. of Germany

Filed Oct. 6, 1983, Ser. No. 550,645
Claims priority, application Fed. Rep. of Germany, Feb. 18, 1982, 3205765
Int. Cl.⁴ B65G *1/04*; B66F *9/07*
U.S. Cl. 414—277 **9 Claims**



1. Apparatus for storing self-supporting pallets and removing the pallets from storage, comprising: a rack shelf arrangement having rows of columns spaced apart and arranged in opposite pairs with respect to columns of an adjacent row; each pair of columns carrying cantilever mounted brackets arranged also in opposite pairs, each pair of brackets defining a shelf for supporting a pallet on two opposite edges of the pallet; said shelves having passageways therebetween; lifting and displacement means for lifting a pallet in a passageway higher than a storage level defined by a pair of said brackets to store and displace the pallet; said lifting and displacement means having two corresponding synchronously vertically displaceable bridges, each bridge extending between columns of two successive shelves; carriage means on each bridge which are synchronously displaceable transversely to the shelves; said carriers means having a platform projecting into a storage area; two shoulders spaced one above the other on said opposite edges of the pallet; a protuberant portion on said platform for supporting the lower one of said shoulders; the upper one of said shoulders being supported by a shelf when a pallet is placed in a shelf.

4,572,720
WOOD SCREW

Gottfried Rockenfeller, Hilchenbach, and Wolfgang Rockenfeller, Hilchenbach-Helberhausen, both of Fed. Rep. of Germany, assignors to Rockenfeller KG, Befestigungselemente, Hilchenbach, Fed. Rep. of Germany

Filed Sep. 1, 1983, Ser. No. 528,572
Claims priority, application Fed. Rep. of Germany, Sep. 2, 1982, 8224737[U]; Sep. 2, 1982, 8224738[U]; Feb. 8, 1983, 8303394[U]
Int. Cl.⁴ F16B *25/00*
U.S. Cl. 411—387 **13 Claims**

1. A wood screw comprising a metallic rod with a threaded extremity having helical turns centered on an axis, an enlarged head at an end opposite said extremity, an unthreaded portion

separating said head from said extremity, and a neck of lesser diameter than said head interposed between the latter and said unthreaded portion, said turns having an outer diameter exceeding that of said unthreaded portion and a root diameter slightly less than that of said unthreaded portion, said neck having a maximum diameter substantially equaling said outer diameter, said neck having an axial length substantially equaling the diameter of said unthreaded portion, said neck tapering frustoconically from said maximum diameter adjacent said head to a diameter equaling that of said unthreaded portion, said turns having a generally trapezoidal profile in axial section with a leading flank and a trailing flank converging radially outward while including acute angles with an intermediate line perpendicular to said axis, said leading flank terminating short of said intermediate line and adjoining a convex curve which

traverses said intermediate line and meets an inwardly sloping back edge extending to said trailing flank.

4,572,721

METHOD FOR DEGREASING NATURAL SKINS, HIDES AND PELTS

Bernard Danner, Riedisheim, France, assignor to Sandoz Ltd., Basel, Switzerland

Filed Jun. 8, 1984, Ser. No. 618,463

Claims priority, application Fed. Rep. of Germany, Jun. 9, 1983, 3320748

Int. Cl.[4] C14C *1/00*

U.S. Cl. 8—94.1 R 26 Claims

1. A process for degreasing a substrate selected from the group consisting of natural skins, pelts and hides, which comprises treating the substrate, prior to tanning, with an aqueous medium having dissolved or dispersed therein a degreasing-effective amount of a primary, secondary or tertiary amine or mixture thereof, said amine having surface-active properties, containing, per molecule, at least one lipophilic residue and at least one ethylene oxide unit and being in free base or at least partially protonated form.

4,572,722

ABRASIVE COMPACTS

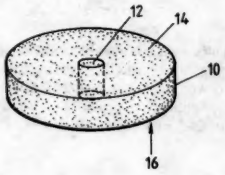
Henry B. Dyer, 28 George St., Bryanston, Transvaal, South Africa

Continuation-in-part of Ser. No. 563,360, Dec. 20, 1983, abandoned. This application Jun. 21, 1984, Ser. No. 622,851

Claims priority, application South Africa, Oct. 21, 1982, 82/9369

Int. Cl.[4] B24D *3/02*

U.S. Cl. 51—309 10 Claims



1. A method of removing a metallic second phase from an abrasive compact containing such a phase wich includes the step of increasing the surface area of the compact by forming a hole in the compact extending inwardly from a surface of the compact prior to or during removal of the second phase.

4,572,723

NITROGEN GENERATOR PROCESS FOR THE PRODUCTION OF LOW VOLUMES OF HIGH PURITY NITROGEN FROM COMPRESSED AIR

Derek E. Ward, Barnet, United Kingdom, assignor to Bergwerksverband GmbH, Essen, Fed. Rep. of Germany

Filed Jul. 23, 1984, Ser. No. 633,185

Claims priority, application United Kingdom, Jul. 23, 1983, 8319880

Int. Cl.[4] B01D *53/04*

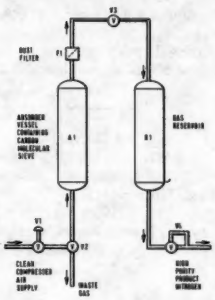
U.S. Cl. 55—25 5 Claims

1. A method of producing a low-oxygen, nitrogen-rich product gas, comprising the steps of:

(a) passing compressed air for a period of about 500 seconds through an adsorber vessel containing a carbon molecular sieve and discharging said product gas therefrom only during a latter part of said period upon the buildup of pressure in said adsorber to a given back pressure, during a first part of an adsorber cycle;

(b) venting said adsorber to the atmosphere during the remainder of said adsorber cycle; and

(c) cyclically repeating steps (a) and (b) alternately in successive adsorber cycles while storing the product gas produced in said cylces at said back pressure to enable continuous draw of product gas from the product gas thus stored.



4,572,724

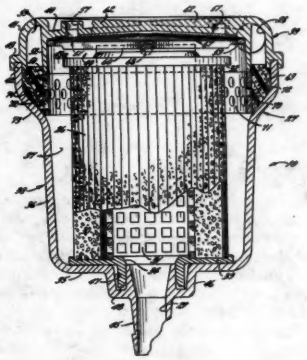
BLOOD FILTER

David J. Rosenberg, Glen Head, and Vlado I. Matkovich, Glen Cove, both of N.Y., assignors to Pall Corporation, Glen Cove, N.Y.

Filed Apr. 12, 1984, Ser. No. 599,585

Int. Cl.[4] B01D *19/00*

U.S. Cl. 55—159 17 Claims



1. Apparatus for separating gas from blood before the blood passes through a filter, said apparatus comprising a housing defining a cylindrical chamber having top and bottom walls and a cylindrical side wall, said bottom wall having an annular opening extending generally around the periphery of said chamber and adapted to communicate with a filter, an annular baffle disposed in said chamber concentrically with said side wall and depending from said top wall to define an annular channel overlying said opening, an inlet communicating with said channel through said side wall and disposed to direct blood into the channel tangentially of the side wall whereby the blood flows in a generally circular path in the channel and generally downwardly out of said chamber through said opening, said circular flow producing a centrifugal action which causes the blood to flow at the outer periphery of said channel while gas entrained in the blood separates and moves inwardly, said baffle having an opening at a point where the baffle has defined a substantial part of a circle beginning near said inlet to permit the gas to enter the center portion of the chamber inside

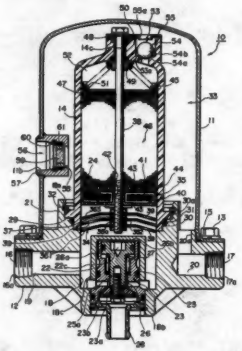
the baffle only after the blood has travelled a substantially full circle, at least one vent opening in the center portion of said top wall to permit gas in the center portion of said chamber to escape from the housing, and a hydrophobic membrane in said top wall covering said vent opening and extending over a substantial part of said center portion of said chamber to permit the automatic flow of gas but not blood out through said vent opening.

4,572,725

AIR DRYER DEVICE

Katsumi Kojima, Yokosuka, Japan, assignor to Nippon Air Brake Co., Ltd., Japan

Filed Nov. 28, 1984, Ser. No. 675,845
Claims priority, application Japan, Dec. 30, 1983, 58-248777
Int. Cl.[4] B01D *53/04*
U.S. Cl. 55—274 **14 Claims**



1. An air dryer device for drying compressed air which comprises:

(a) a housing having an inlet port and an outlet port;

(b) an elongated desiccant container mounted within said housing and holding a granular desiccant therein which may be regenerated by reverse flushing, one end of said desiccant container communicating with said inlet port while the other end communicates with said outlet port, so that the compressed air fed to said inlet port is passed through said desiccant container to be dried and is discharged from said outlet port, at least part of said desiccant container being transparent;

(c) an inspection window mounted on said housing at a predetermined level in opposed relation to said transparent part of said desiccant container so that said desiccant in said desiccant container can be viewed from outside said housing through said inspection window and said transparent part of said desiccant container for inspecting an oil contamination level of said desiccant, said inspection window including a lens; and

(d) a drain valve mounted below the desiccant container which may be selectively opened to drain said container and regenerate the desiccant.

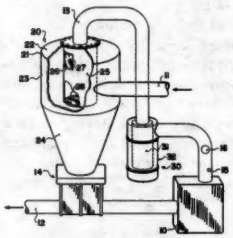
4,572,726

CYCLONE SEPARATOR

Art Van Abbema, Winnipeg, Canada, assignor to Vana Industries Ltd., Winnipeg, Canada

Filed Jul. 25, 1983, Ser. No. 516,922
Int. Cl.[4] B01D *50/00*
U.S. Cl. 55—337 **12 Claims**

1. A cyclone separator for extracting particulate material for an air stream comprising an outer cylindrical container arranged with its axis vertical and having a closed top wall, and inner cylinder co-axial with and arranged inside the outer container to form an annular space therebetween, said inner cylinder depending from said closed top wall, an outlet connected through the closed top wall for withdrawing air from the container and communicating with the interior of said inner cylinder and an inlet for the air and particulate material arranged to inject air substantially tangentially into the annular space, said inner cylinder having an imperforate peripheral



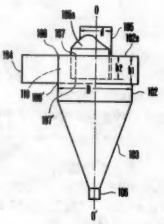
wall extending from said closed top wall to an open bottom at a position below the inlet and an opening in the peripheral wall communicating with said annular space, said opening being sufficiently large to receive the majority of the air from said inlet and being confined in said peripheral wall to an area above said inlet having an angular extent less than 180° and angularly spaced from the inlet such that a portion of the peripheral wall immediately adjacent the inlet is imperforate.

4,572,727

CYCLONE

Kiyosawa Masayuki; Inoue Nobuaki, and Sonoda Elichi, all of Ube, Japan, assignors to Ube Industries, Ltd., Japan

Filed Apr. 11, 1984, Ser. No. 599,046
Claims priority, application Japan, Apr. 14, 1983, 58-64503
Int. Cl.[4] B04C *3/06*; B01D *45/12*
U.S. Cl. 55—414 **6 Claims**



1. In a cyclone comprising a cylindrical shell, an inverted conical hopper depending from said cylindrical shell, a cylindrical dust exhaust duct leading from the lower end of said inverted conical hopper, a gas supply duct extending tangentially or circumferentially of said cylindrical shell for introducing dust-containing gas into the cyclone, and a cylindrical gas exhaust duct penetrating the top wall of said cylindrical shell with the lower end of said gas exhaust duct positioned below said top wall, the peripheral wall of said cylindrical shell having a projecting side wall portion inwardly projecting into the cyclone and terminating in the joint of the inner side wall of said gas supply duct and the peripheral wall of said cylindrical shell, the improvement wherein said cylindrical gas exhaust duct has a protruding portion smoothly protruding from the lower side wall of said gas exhaust duct and having a diameter at least equal to the diameter of said gas exhaust duct, the lower surface of said cylindrical gas exhaust duct (105) being flush with that of said protruding portion, said lower surfaces

being lower than the top wall (**102***a*) of the cylindrical shell (**102**), and the upper surface of said protruding portion being higher than the top wall of the cylindrical shell.

4,572,728

LIQUID/GAS CARBON DIOXIDE EVAPORATOR

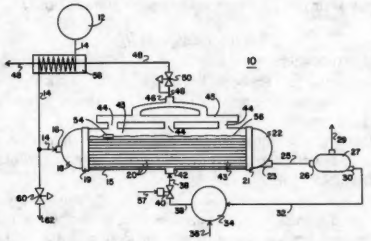
Albert N. Heichberger, P.O. Box 16562, Jacksonville, Fla. 32245

Continuation-in-part of Ser. No. 511,270, Jul. 6, 1983, Pat. No. 4,498,303. This application Jan. 6, 1984, Ser. No. 568,717

The portion of the term of this patent subsequent to Feb. 12, 2002, has been disclaimed.

Int. Cl.[4] **F25J** *1/00*

U.S. Cl. 62—21 **22 Claims**



1. A process for condensing a source flow of carbon dioxide gas in conjunction with evaporating a carbonation flow of carbon dioxide gas, which comprises eliminating the necessity for evaporating said carbonation flow and for condensing said source flow by separate means including

passing a source flow of carbon dioxide gas in indirect heat exchange relation with a coolant flow of liquid carbon dioxide while

flashing said coolant flow at a selectively reduced pressure to maintain said heat exchange relation;

directing the condensed source flow into a reservoir of liquid carbon dioxide;

providing said coolant flow of liquid carbon dioxide from said reservoir; and

simultaneously using the flashed coolant flow as a carbonation flow.

4,572,729

METHOD FOR PRODUCING ARTICLES OF HIGH-PURITY SYNTHETIC QUARTZ GLASS

Winfried Lang, Ach, Austria; Rudolf Griesshammer, Altötting, Fed. Rep. of Germany; Michael Schwab, Neuötting, Fed. Rep. of Germany, and Werner Zulehner, Haiming, Fed. Rep. of Germany, assignors to Wacker-Chemitronic Gesellschaft fur Elektronik-Grundstoffe mbH, Burghausen, Fed. Rep. of Germany

Filed Dec. 30, 1983, Ser. No. 567,086

Claims priority, application Fed. Rep. of Germany, Jan. 27, 1983, 3302745

Int. Cl.[4] **C03B** *19/06, 20/00*

U.S. Cl. 65—18.1 **3 Claims**

1. A method for producing articles of high-purity synthetic quartz, comprising the steps of:

(a) hydrolyzing liquid silicon tetrachloride with water in a liquid phase hydrolysis reaction by adding said water to an excess amount of said silicon tetrachloride so as to produce a hydrolysis product, said liquid silicon tetrachloride having a purity at least equivalent to the purity of silicon tetrachloride as obtained as a by-product in the production of polycrystalline silicon by decomposition of trichlorosilane and said water having a purity of approximately equal degree to that of said liquid silicon tetrachloride;

(b) separating and drying the hydrolysis product;

(c) shaping the dried hydrolysis product to form an article having at least one inside wall;

(d) sintering said article; and

(e) superficially fusing said sintered article so that said inside wall thereofd has a quartz fused surface layer which has a thickness of about from 20–40% of the total wall thickness.

4,572,730

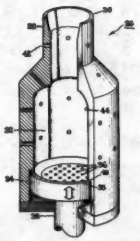
METHOD OF MAKING A RIBBON BLOWN GLASS ARTICLE

Raymond J. Noe, Warren, Ohio, assignor to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 519,436, Aug. 1, 1983. This application Oct. 22, 1984, Ser. No. 663,268

Int. Cl.[4] **C03B** *9/12*

U.S. Cl. 65—67 **8 Claims**



1. A method of continuously forming a blown glass envelope terminating in a self-supporting base end from a molten ribbon of glass supported on a moving conveyor which comprises:

(a) blowing a portion of the glass from said molten ribbon into the central cavity of a single multi-part mold, said mold including a pair of cooperative halves forming the sides of said blown glass while being blown and which mold further includes a separate base part located at the lower end of said cavity to form the self-supporting base portion of said blown glass envelope, said base part of the mold being provided with reciprocal motion in a vertical direction,

(b) having the base part of said mold move upwardly and remain in an upward position while the glass envelope is being blown to form all structural features in said blown glass envelope but then move downwardly and release the lamp glass envelope before the mold halves are opened,

(c) opening the mold halves to release the sides of the solidified blown glass envelope, and

(d) severing the blown glass envelope from the moving glass ribbon.

4,572,731

PINCH MEANS FOR ATTENUATING FLOAT GLASS AND METHOD OF USING SAME

O. Franklin Williams, Jr., Mendville, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

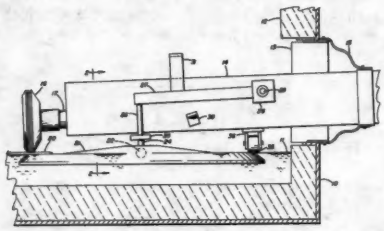
Filed Dec. 24, 1984, Ser. No. 685,427

Int. Cl.[4] **C03B** *18/06*

U.S. Cl. 65—99.5 **16 Claims**

9. A method of forming flat glass comprising delivering a stream of molten glass onto a pool of molten metal so as to form a ribbon of glass that is passed longitudinally along the pool of molten metal, engaging the top surface of the glass ribbon in a marginal edge portion with an attenuating device

that imparts a transverse component of force to the glass ribbon, providing an upward force to the region of the ribbon



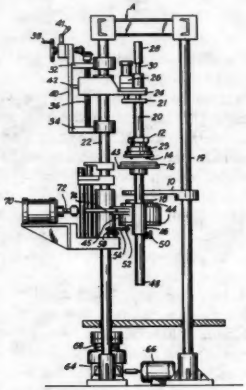
engaged by the attenuating device by means of a solid member buoyantly contacting the underside of the glass ribbon.

4,572,732

MACHINE FOR CUTTING OFF EXCESS ENDS OF HOLLOW GLASS, PLASTIC OR SIMILAR ARTICLES

Abel Gómez-Sánchez, Monterrey; Jaime Valdes-Neri, Guadalupe, and Miguel H. C. Quintero, San Nicolas de Los Garza, all of Mexico, assignors to Vitrocrisa Cristaleria, S.A., Nuevo Leon, Mexico

Filed Jul. 25, 1984, Ser. No. 634,300
Claims priority, application Mexico, Jul. 28, 1983, 198198
Int. Cl.[4] C03B *21/02*
U.S. Cl. 65—271 6 Claims



1. A machine for trimming opposite excess ends of elongate tubular articles of glass, plastic or similar materials, and comprising:

means for the stationary support of an elongage tubular semi-finished article at a position intermediate its ends, and with its longitudinal axis oriented substantially vertically;

two pairs of split burners, one located for flame cutting an upper excess part of the article, and the other located for flame cutting a lower excess part of the article, said respective pairs of split burners being coupled to each other for them to open and close in unison about both said excess ends of said article;

means for centering and holding said article, including means for raising said centering and holding means at a predetermined rate of movement after cutting action has been effected; and,

means for simultaneously oscillating said respective burners along circular paths substantially concentric with said elongate tubular member at the time said burners are closed around the excess ends of said article.

4,572,733

AGRICULTURAL APPLICATION OF BORON COMPOUNDS

Frank A. Howard, Poynton, England, assignor to Mostyn Chemicals Ltd., Manchester, England

Continuation-in-part of Ser. No. 505,186, Jun. 17, 1983, abandoned. This application Mar. 13, 1985, Ser. No. 711,406
Claims priority, application United Kingdom, Jun. 21, 1982, 8217863
Int. Cl.[4] A01N *25/00*
U.S. Cl. 71—64.08 3 Claims

1. A method for applying boron to a crop or a crop area in which a crop is being grown or is to be grown, which comprises the steps of

(1) forming a solution of a first boron compound, effective to provide boron to crops or crop areas, in a water-miscible glycol solvent;

(2) dispersing fine particles, from 1 to 20 μm in size, of a second boron compound, effective to provide boron to crops or crop areas, in stable dispersion in the said solution, thereby to form a storage-stable concentrate composition having a total boron compound content of at least 5% by weight (calculated as boron) and greater than that which will form a saturated solution in said water-miscible glycol solvent; wherein said first boron compound and said second boron compound are the same or different and are selected from the group consisting of sodium and potassium tetraborates and polyborates, and wherein the weight ratio of the dispersed boron compound to the dissolved boron compound is from 0.2:1 to 5:1;

(3) diluting the thus-obtained concentrate composition with water; and

(4) applying the diluted composition to a crop or a crop area.

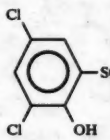
4,572,734

PLANT GROWTH-REGULATING AGENTS

Dieter Berg; Wolf Reiser, both of Wuppertal, and Klaus Lürssen, Bergisch Gladbach, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Apr. 24, 1984, Ser. No. 603,461
Claims priority, application Fed. Rep. of Germany, Apr. 29, 1983, 3315593
Int. Cl.[4] A01N *41/06*
U.S. Cl. 71—72 4 Claims

1. A process for defoliating and desiccating cotton plants which comprises applying to the cotton plants or to their habitat and effective amount of 3,5-dichloro-2-hydroxy-benzenesulphonamide of the formula



(I)

4,572,735

PROCESS FOR SORTING METAL PARTICLES

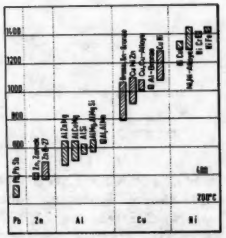
Manfred Poetzschke, Kronberg, and Hans-Peter Sattler, Bad Homburg, both of Fed. Rep. of Germany, assignors to Metallgesellschaft Aktiengesellschaft; Eumet Metallaufbereitungsgesellschaft mbH & Co., both of Frankfurt, Fed. Rep. of Germany and RTZ Ore Sorters (North America) Inc., Alpharetta, Ga.

Filed Feb. 8, 1984, Ser. No. 577,951

Claims priority, application Fed. Rep. of Germany, Feb. 12, 1983, 3304850

Int. Cl.[4] C22B *7/00*

U.S. Cl. 75—10 R 11 Claims



1. In a process of sorting metal or metal alloy particles of different composition, wherein the particles are singled and conveyed, the improvement comprising partially melting the particles and measuring the melting temperature while the particles are being conveyed and sorting the particles on the basis of the melting temperature corresponding thereto.

4,572,736

PROCESS FOR PRODUCING MAGNESIUM

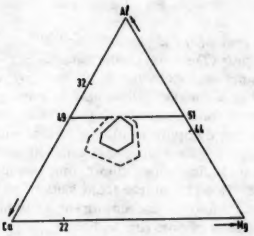
Geoffrey F. Warren, Leidschendam, and Andrew M. Cameron, Arnhem, both of Netherlands, assignors to Shell Internationale Research Maatschappij B.V., Netherlands

Filed Nov. 28, 1984, Ser. No. 675,600

Claims priority, application United Kingdom, Dec. 21, 1983, 8334022

Int. Cl.[4] C22B *4/02, 26/22*

U.S. Cl. 75—10 R 15 Claims



1. A process for producing magnesium by stoichiometric conversion of magnesia with carbon at a temperature of from 2000° K. to 2300° K. and atmospheric pressure which comprises effecting the reaction in a reactor in the presence of a liquid slag comprising oxides or mixed oxides and carbides of magnesium, calcium and aluminium in relative weight proportions, calculated as atomic metal:metal ratios, which by continued introduction of appropriate feedstock into the reactor are being kept within the following ranges

(i) Mg:Ca from 0.28:1 to 1.34:1

(ii) Al:Mg from 0.79:1 to 3.16:1

(iii) Ca:Al from 0.48:1 to 1.50:1

under the proviso that the total amount of gramatom aluminium is less than 51% of the total amount of gramatoms aluminium, calcium and magnesium contained in the slag.

4,572,737

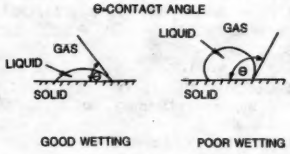
AGENTS FOR THE REMOVAL OF IMPURITIES FROM A MOLTEN METAL AND A PROCESS FOR PRODUCING SAME

Stewart W. Robinson, La Grange, Ky.; Roger W. Bartram, Basking Ridge, and John A. Dehuff, Madison, both of N.J., assignors to The BOC Group, Inc., Montvale, N.J.

Filed Jun. 27, 1984, Ser. No. 624,867

Int. Cl.[4] C21C *7/00*

U.S. Cl. 75—53 24 Claims



1. An agent for removing impurities from a preselected molten metal comprising a first compound capable of reacting with and removing said impurities contained in said preselected molten metal, said first compound comprising calcium carbide, and a second compound coated on said first compound to form a composite, said second compound having a contact angle with said preselected molten metal less than that of said first compound, thereby causing said composite to be more wettable as compared to said first compound in said preselected molten metal, allowing said composite to penetrate into said preselected molten metal resulting in said first compound reacting with said impurities contained within said preselected molten metal.

4,572,738

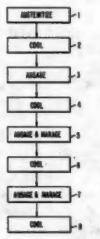
MARAGING SUPERALLOYS AND HEAT TREATMENT PROCESSES

Michael K. Korenko, Wexford, Pa.; David S. Gelles, W. Richland, and Larry E. Thomas, Richland, both of Wash., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Continuation-in-part of Ser. No. 305,411, Sep. 24, 1981, abandoned. This application Apr. 21, 1982, Ser. No. 370,439

Int. Cl.[4] C21D *7/14*

U.S. Cl. 75—128 Z 25 Claims



1. An iron base composition maraging superalloy characterized by a gamma prime strengthened microstructure, wherein beta prime precipitates, and gamma prime precipitates are dispersed in a ferritic matrix; and said maraging superalloy consisting essentially of the following elements:

approximately 18 to 25 weight percent Ni;

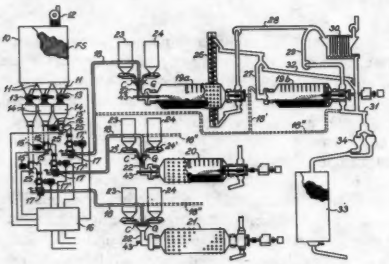
approximately 4 to 8 weight percent Cr;
approximately 0.5 to 1.5 weight percent of Mo, a solid solution strengthening agent;
approximately 1.5 to 3.5 weight percent Ti;
approximately 0.4 to 2.5 weight percent Al;
and with Fe forming essentially the balance of said iron base composition maraging superalloy.

4,572,739

METHOD FOR REDUCING CHROMATE DERMATITIS

Poul L. Rasmussen, Fabriksvej 18, Ronne, Denmark (DK-3700)

PCT No. PCT/DK81/00115, § 371 Date Aug. 16, 1982, § 102(e) Date Aug. 16, 1982, PCT Pub. No. WO82/02040, PCT Pub. Date Jun. 24, 1982
Continuation of Ser. No. 413,351, Aug. 16, 1982, abandoned.
This PCT application Dec. 16, 1981, Ser. No. 617,835
Claims priority, application Denmark, Dec. 17, 1980, 5380/80; Sep. 17, 1981, 4140/81
Int. Cl.[4] C04B 7/54
U.S. Cl. 106—101 8 Claims



1. A method for reducing chromate dermatitis, comprising:
feeding a continuous flow of a starting material mixture comprising cement binder clinker into a cement mill, the mixture containing water soluble chromate;
grinding the starting material in the cement mill;
continuously transferring ground cement material from the cement mill to a storage container;
adding non-dissolved ferrous sulfate in an amount of 0.3–1 percent by weight to said flow of material at least at one location upstream of the storage container; and
mixing the ferrous sulfate with the ground cement material so as to produce a cement composition in which the water-soluble chromate is chemically reduced when water is added to and mixed with the composition.

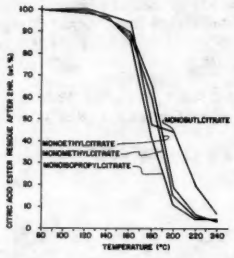
4,572,740

CITRIC ACID ESTERS AS BLOWING AND NUCLEATING AGENTS IN THE PROCESSING PLASTICS

Günther Kretzschmann, Munster-Sarmsheim; Dieter Scholz, Gau-Algesheim, and Karl-Heinz Hilgert, Ingelheim, all of Fed. Rep. of Germany, assignors to Boehringer Ingelheim KG, Ingelheim am Rhein, Fed. Rep. of Germany

Filed Mar. 26, 1985, Ser. No. 716,295
Claims priority, application Fed. Rep. of Germany, Mar. 28, 1984, 3411319
Int. Cl.[4] C08L 1/12; C08J 9/06
U.S. Cl. 106—122 6 Claims

1. A method for producing foam or cellular plastic which comprises forming said plastic from a composition which includes a thermoplastic organic material and a mono- or diester of citric acid formed with an alcohol having up to 8



carbon atoms and heating said composition to produce said foam.

4,572,741

APPARATUS FOR PROCESSING SUGAR CANE

William Mason, 16103-86 Ave., Edmonton, Alberta, Canada

Continuation of Ser. No. 295,092, Aug. 21, 1981, abandoned.
This application Dec. 27, 1983, Ser. No. 565,612
Int. Cl.[4] C13C 1/04
U.S. Cl. 127—2 27 Claims

1. An apparatus for processing sugar cane, said apparatus comprising the following units connected in series in the order recited:
(a) an inlet station (1) for receiving randomly oriented cane stalks;
(b) a feed control station (2) for controlling the quantity of cane stalks fed to the remainder of the apparatus;
(c) an aligning station (3) for making a first alignment of said cane stalks;
(d) chopping means (4) for chopping said cane stalks into billets;
(e) cleaning means (5) for cleaning said billets;
(f) hopper means (7) for receiving said billets;
(g) billet aligner and delivery means (9) for aligning said billets by tumbling said billets and delivering said billets for subsequent billet separation processing and including means (88) for damping tumbling of said billets prior to billet separation processing, said billet aligner and delivery means including surge eliminating means for providing an even flow of billets from said billet aligner and delivery means and for preventing surges of billets into the separator means of part (h); and
(h) separator means (10) for separating the cane billets into epidermis, rind and core components and including a casing (98), a feed drum (106) for gripping cane billets in cooperation with a backing surface, splitter blade means (102) in said casing for receiving cane billets and for splitting each cane billet into two pieces, and a milling drum (104) for milling said pieces; said milling drum (104) comprising an elongated cylindrical body (135), a plurality of milling blades (109), blade receiving slots (136) formed in and extending longitudinally of said body for receiving said milling blades, additional slots (137) between each adjacent pair of milling blade receiving slots, whereby the sides of said blade slots may be flexed toward and away from each other for releasably securing said milling

blades, and screw means (142) for causing said flexing of said sides for forcing the sides of the milling blade receiving slots together for gripping said milling blades.

4,572,742

PRECOAT FILTER AND METHOD FOR NEUTRALIZING SUGAR SYRUPS

Robert Kunin, Yardley, Pa., and Eli Salem, Deal, N.J., assignors to The Graver Company, Union, N.J.

Filed Sep. 28, 1983, Ser. No. 536,687
Int. Cl.[4] C13D 3/14
U.S. Cl. 127—46.2 14 Claims

1. A method for neutralizing, decolorizing and decalcifying a sugar syrup including sucrose comprising the steps of:

providing a porous support means;

precoating the porous support means with a liquid slurry constituted by an aqueous suspension of a fibrous filter aid material and a neutralizing amount of a particulate, crystalline alumino-silicate molecular sieve having an average particle size of less than about 10 microns to form a precoat filter layer substantially coextensive with the porous support means; and

contacting the sugar syrup with said precoat filter layer by passing said sugar syrup through said porous support means at a rate sufficient to neutralize, decolorize and decalcify the sugar syrup.

4,572,743

METHOD FOR PICKLING METALLIC SURFACES

Dieter J. Müller, and Heinrich Spielbrink, both of Marl, Fed. Rep. of Germany, assignors to Huels Aktiengesellschaft, Marl, Fed. Rep. of Germany

Filed Apr. 24, 1984, Ser. No. 603,273
Claims priority, application Fed. Rep. of Germany, Apr. 26, 1983, 3314974; Jul. 9, 1983, 3324823
Int. Cl.[4] C23G 1/02
U.S. Cl. 134—3 33 Claims

1. A method for removing rust and/or scale from a metal surface, comprising contacting said metal surface with a homogeneous pickling solution comprising water, a major amount of a halogenated hydrocarbon solvent suitable for degreasing and phosphating baths, an amount of at least one alcoholic solubilizer effective to maintain homogeneity of the pickling solution, an effective pickling amount of above 2% by weight based on said pickling solution of a pickling agent selected from phosphoric acid, and mixtures of phosphoric acid and mineral or organic acid, said mixtures having a weight ratio of phosphoric acid to other mineral or organic acid between about 1:2 and 5:1; the water in the solution being sufficient to dissolve the acid but not so much as to provide a separate aqueous phase, and an effective inhibiting amount of at least one inhibitor for protecting the bare metal surface from attack by said pickling agent; wherein said contacting is effected at a temperature from room temperature up to the boiling point of said pickling solution; and wherein said contacting is continued for a time sufficient to substantially remove said rust and/or scale.

4,572,744

PROCESS FOR CLEANING THE INTERIOR OF A CONDUIT HAVING BENDS

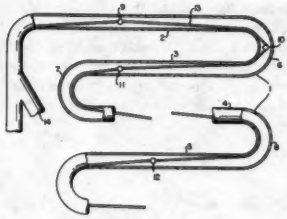
George C. Dominick, Kingwood, Tex., assignor to Union Carbide Corporation, Danbury, Conn.

Filed Sep. 23, 1982, Ser. No. 422,080
Int. Cl.[4] B08B 9/04
U.S. Cl. 134—7 24 Claims

1. An improved process for the cleaning of the interior of a conduit having a series of straight sections and bends comprising:

(a) passing a transit line to the inlet end of said conduit for passage therethrough, said line having a multiplicity of flow diverters positioned at intervals along the length thereof such that at least more than one such flow diverter is employed for five straight section-bend combinations, said conduit having at least five such combinations, said flow diverters being adapted for activation as propulsive bodies soley by the injection of a propelling gas stream into the conduit itself through the inlet end thereof, no other propulsive bodies or means of propulsion being positioned along the length of said transit line;

(b) activating said flow diverters within said conduit solely by injecting of a propelling gas stream into the conduit through the inlet end thereof, said flow diverters being adapted for diverting said gas in the direction of the inside surfaces of said conduit to be cleaned, said propelling gas stream being injected into the conduit at a gas flow rate corresponding to an outlet gas velocity of from about 5,000 feet per minute up to the sonic velocity of the propelling gas stream, which has entrained therein cleaning particles capable of the in-situ cleaning of the inside surfaces of the conduit, said injection of the particle entrained, propelling gas stream being maintained for a sufficient time to effect cleaning of the conduit while the propelling gas stream causes the flow diverters and the transit line to move along the straight sections and around the bends of said conduit, whereby said multiplicity of flow diverters serves to enhance the in-situ cleaning action of said cleaning particles and to overcome the capstan effect that otherwise impedes the passage of the transport line through said conduit having at least five straight section-bend combinations, thereby facilitating the convenient passage of said line along said straight sections and around the bends from the inlet to the discharge end of the conduit to facilitate the in-situ cleaning thereof.

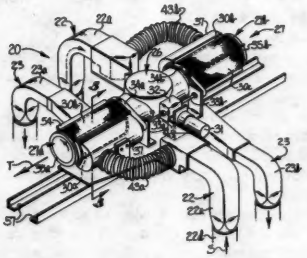


4,572,745

SINGLE-AIR TRAVELING SUCTION BLOWER CLEANER WITH AUTOMATIC DOFFING

Thomas R. House, Charlotte, N.C., assignor to Parks-Cramer Company, Fitchburg, Mass.

Filed Sep. 18, 1984, Ser. No. 651,872
Int. Cl.[4] B08B 7/04
U.S. Cl. 134—10 36 Claims



1. A traveling suction floor cleaner for cleaning textile mills

and adapted for periodic removal of textile waste material collected by the cleaner, said traveling suction cleaner comprising:

a suction blower fan;

means for causing said suction blower fan to travel adjacent one or more textile machines;

a housing for enclosing said suction blower fan;

suction duct means communicating with said housing and arranged for carrying suction air and entrained textile waste material from the floor of a textile mill to said suction blower fan;

said suction blower fan, said housing and said suction duct means defining a suction air path;

filter means having filtration surfaces positioned within said suction air path for receiving entrained textile waste material while permitting air flow therethrough; and

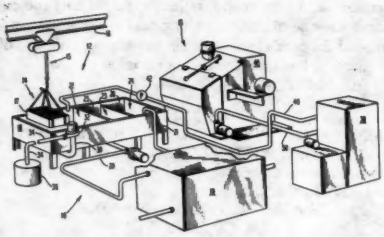
means for moving said filter means for successive presentation for filtration of clean filtration surfaces on said filter means to collect textile waste from the suction air path, and for concurrent successive presentation for waste removal of filtration surfaces on said filter means having collected textile waste material thereon.

4,572,746

ACID REMOVAL FROM DRY CHARGE BATTERY PLATES

Paul C. Wegner, San Carlas, Calif., assignor to Tiegel Manufacturing Co., Belmont, Calif.

Filed Mar. 29, 1984, Ser. No. 594,792
Int. Cl.[4] B08B 7/04
U.S. Cl. 134—10 **12 Claims**



1. For use in connection with the manufacture of storage battery plates, a process for removing acid from the plates, comprising the steps of:

(a) washing the plates in flowing water until most of the acid has been removed from the plates at a water flow rate which is lower than that of a subsequent washing of step (b);

(b) thereafter, removing additional acid from the battery plates by washing said plates in additional flowing water at a water flow rate producing an acid concentration in the additional wash water less than that produced in step (a) above;

(c) discharging the additional wash water resulting from step (b) and treating said discharged water to remove the acid therefrom; and

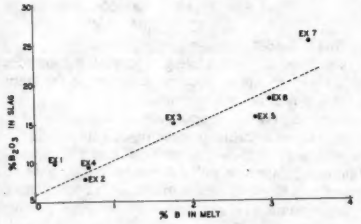
(d) using the treated water from step (c) for washing in at least one of said washing steps (a) and (b).

4,572,747

METHOD OF PRODUCING BORON ALLOY

Richard C. Sussman, West Chester, and Larry G. Evans, Middletown, both of Ohio, assignors to Armco Inc., Middletown, Ohio

Filed Feb. 2, 1984, Ser. No. 576,341
Int. Cl.[4] C22C 1/00, 33/00
U.S. Cl. 148—3 **29 Claims**



1. A process for producing a metallic melt having from about 1.4%–15% boron by weight, comprising:

providing a metallic melt containing an exothermic reductant capable of reducing a boron compound;

adding a sufficient amount of said boron compound to said melt to achieve the desired melt having at least about 1.4% boron by weight; and

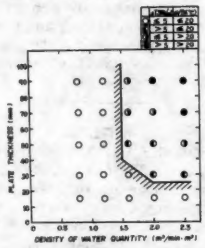
vigorously mixing said melt and said boron compound to acheive and sustain substantial equilibrium, to reduce said boron compound and alloying boron therein with said melt, and to produce said metallic melt having less than about 0.2% carbon and less than about 0.01% aluminum, by weight.

4,572,748

METHOD OF MANUFACTURING HIGH TENSILE STRENGTH STEEL PLATES

Masataka Suga, Tokyo; Makoto Yamada; Kazuhide Takahashi, both of Kanagawa; Nobuhiro Iwasaki, Hiroshima; Kazuyuki Matsui, Hiroshima; Toru Izawa, Hiroshima; Itaru Watanabe, Kanagawa, and Hisatoshi Tagawa, Kinosho, all of Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 556,026, Nov. 29, 1983, abandoned.
This application Apr. 15, 1985, Ser. No. 722,763
Claims priority, application Japan, Nov. 29, 1982, 57-207629
Int. Cl.[4] C21D 1/18, 1/62
U.S. Cl. 148—12 F **2 Claims**



1. A method of manufacturing a high tensile strength of at least 90 kg/mm^2 steel plate at least 50 mm thick and having substantially uniform physical properties throughout the length and thickness of said plate comprising the steps of heating steel consisting essentially of 0.04–0.16% by weight of carbon, 0.02–0.50% by weight of silicon, 0.4–1.2% by weight

of manganese, 0.2–5.0% by weight of nickel, 0.2–1.5% by weight of chromium, 0.2–1.0% by weight of molybdenum, 0.01–0.10% by weight of acid soluble aluminum, 0.03–0.15% by weight of one or more of vanadium, titanium and niobium, 0.015% or less by weight of phosphorus, 0.006% or less by weight of sulfur and the balance of iron and inherent impurities, to a temperature above the temperature at which carbonitrides of vanadium and niobium and carbides of titanium are completely in the solid solution state; rolling the steel with total reduction of at least 40% at a temperature below 950° C., said steel at the completion of said rolling being at a temperature above $(A_3-50)°$ C. and a thickness (t) of at least 50 mm; quenching the rolled steel plate by simultaneous cooling the entire steel plate immediately after completion of the rolling from a temperature above $(A_3-50)°$ C.; and tempering the steel plate at a temperature lower than Ac_1 temperature; the density of cooling water (W) for the quenching being determined by the following equation:

$$W=0.7 \text{ to } 1.5 m^3/min \cdot m^2$$

4,572,749

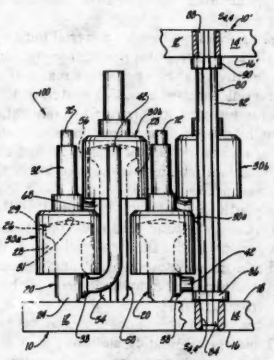
METHOD AND AN APPARATUS FOR HEAT TREATMENT OF A WORKPIECE

Richard Emerson, Mebane, N.C., assignor to GKN Automotive Components, Inc., Southfield, Mich.

Filed Mar. 7, 1984, Ser. No. 587,297

Int. Cl.[4] C21D *9/40, 1/74*

U.S. Cl. 148—16.5 **19 Claims**



1. An apparatus for the heat treatment of an outer race member of a universal joint, said outer race member having a cavity formed therein, said apparatus comprising:

a horizontally disposed base means;

socket means integrally disposed with said horizontally disposed base means;

elongated vertically disposed post means, said elongated vertically disposed post means having a lower end interconnected with said horizontally disposed base means and an upper end remote from said lower end, said upper end removably insertable in said cavity of said outer race member such that said upper end supports said outer race member, said lower end of said elongated vertically disposed post means further comprising plug means, said plug means being removably insertable in said socket means for interconnecting said elongated vertically disposed post means with said horizontally disposed base means; and

passage means extending at least partially longitudinally of said elongated vertically disposed post means, said passage means having a first port means opening into said cavity and a second port means disposed remote from said outer race member, said passage means communicating said cavity with the environment external of said cavity to vent fluid from said cavity during a heat treatment operation.

4,572,750

MAGNETIC ALLOY FOR MAGNETIC RECORDING-REPRODUCING HEAD

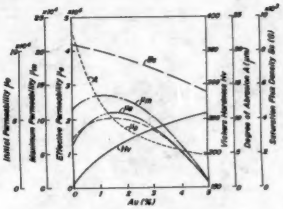
Hakaru Masumoto, Sendai City, and Yuetsu Murakami, Izumi City, both of Japan, assignors to The Foundation: The Research Institute of Electric and Magnetic Alloys, Japan

Filed Jun. 25, 1984, Ser. No. 624,290

Claims priority, application Japan, Jul. 21, 1983, 58-131817; Dec. 27, 1983, 58-244713

Int. Cl.[4] C04B *35/00*

U.S. Cl. 148—31.55 **4 Claims**



1. A magnetic alloy for magnetic recording-reproducing head consisting of, in percentage by weight, major ingredients, 0.01–30% of at least one auxiliary ingredient, a small amount of impurities, and the remainder of iron; said major ingredients consisting of 60–86% of nickel (Ni), 0.5–14% of niobium (Nb), and 0.001–5% in sum of at least one element selected from the group consisting of less than 5% of gold (Au), less than 5% of strontium (Sr), and less than 5% of barium (Ba); said auxiliary ingredient being selected from the group consisting of less than 8% of molybdenum (Mo), less than 7% of chromium (Cr), less than 10% of tungsten (W), less than 7% of titanium (Ti), less than 7% of vanadium (V), less than 10% of manganese (Mn), less than 7% of germanium (Ge), less than 5% of zirconium (Zr), less than 5% of rare earth elements, less than 10% of tantalum (Ta), less than 3% of beryllium (Be), less than 1% of boron (B), less than 5% of aluminum (Al), less than 5% of silicon (Si), less than 5% of hafnium (Hf), less than 5% of tin (Sn), less than 5% of antimony (Sb), less than 10% of cobalt (Co), and less than 25% of copper; said alloy having an initial permeability of more than 3,000, a maximum permeability of more than 5,000, a saturation flux density of more than 5,000 G, and a Vickers hardness of more than 130.

4,572,751

CAST IRON MOLD FOR PLASTIC MOLDING

Itsuro Oguri, Nagoya, and Yasuhiro Miyamoto, Handa, both of Japan, assignors to NGK Insulators, Ltd., Japan

Filed Jun. 6, 1984, Ser. No. 617,930

Claims priority, application Japan, Jun. 15, 1983, 58-107521

Int. Cl.[4] C21D *5/00*; C22C *37/04*

U.S. Cl. 148—35 **4 Claims**

1. A nodular graphite cast iron mold for molding plastics comprising:

a composition which consists of 2.5–3.8% by weight of carbon, 2.0–3.0% by weight of silicon, not more than 0.8% by weight of manganese, 2.0–5.0% by weight of nickel, 0.2–1.0% by weight of molybdenum, and the balance being iron, spheroidizing elements and impurities which are necessarily present in the nodular graphite cast iron; and

said carbon is crystallized from a melt to result in crystallized spheroidal graphite particles in a peripheral portion of said mold having a particle size distribution wherein at least 90% of the crystalized spheroidal graphite particles

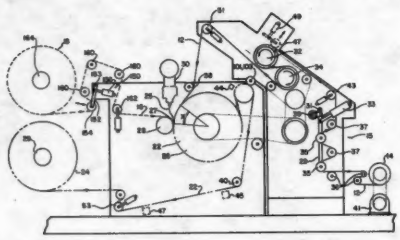
are less than or equal to 10 microns in size and at least 50% of the crystallized spheroidal graphite particles are less than or equal to 6 microns in size.

4,572,752

CONTROL STRETCH LAMINATING DEVICE

James W. Jensen, Boulder, and Joseph R. Haake, Broomfield, both of Colo., assignors to Adolph Coors Company, Golden, Colo.

Continuation-in-part of Ser. No. 441,276, Nov. 12, 1982, Pat. No. 4,496,417. This application Jun. 22, 1984, Ser. No. 624,480
Int. Cl.[4] B65B *41/18*
U.S. Cl. 156—64 **22 Claims**



1. A high speed laminating apparatus for laminating plastic film material to a paper material to form a laminating composite the film material passing through the apparatus in continuous longitudinally extending web having an upstream portion entering the apparatus and a downstream portion exiting the apparatus; the film material normally being extensibly deformable such that the longitudinal distance between any two reference points on the film web may vary during lamination; the apparatus comprising:

paper supply unwind roll means for providing a continuous supply of paper to be laminated;

film supply unwind roll means for providing a continuous supply of film to be laminated;

laminating nip means, for drawingly engaging said film web and said paper web in parallel touching contact whereby each said web is moved at the same web speed, and for bondingly compressing said film web to said paper web to form a laminated composite;

film web stretch control means positioned between said laminating nip means and said film supply unwind roll means for frictionally engaging said film web and for varying the web velocity of the portion of the film web passing therethrough relative to the velocity of the laminating nip for selectively stretching or shrinking the film web portion passing between the film web stretch control means and the laminating nip means during continuous movement of the film web through the laminating nip means;

film length monitoring means for measuring the length of predetermined portions of said film web at a position downstream said laminating nip means and for providing a monitor signal to a data processing means;

data processing means for comparing said monitor signal to a predetermined length value and providing command signals responsive there to said film web stretch control means for imparting a predetermined amount of stretch or relaxation to said film web whereby predetermined portions of said film web are continuously extensibly adjusted to a predetermined length;

paper supply speed control means for controlling the rate at which paper is supplied from said paper unwind roll means for providing relatively constant tension in a length of paper web positioned between said paper unwind roll means and said laminating nip means;

film supply speed control means for controlling the rate at which film is supplied from said film unwind means wherein said film supply speed control means is actuated to provide a film web speed at said film supply means substantially equal to the film web speed at said film web stretch control means whereby a first substantially constant film tension zone is provided in said film web between said film supply means and said film web stretch control means and a second variable tension zone is provided in said film web between said film web stretch control means and said laminating nip means;

composite web speed control means for controlling the speed of said composite web for providing relatively constant tension in said composite web immediately downstream of said laminating nip means.

13. A method of laminating paper sheet material in roll form to plastic film sheet material in roll form by use of an adhesive material comprising the steps of:

mounting a roll of the paper sheet material on a first feed roll;

mounting a roll of the film sheet material on a second feed roll;

simultaneously, continuously unwinding the roll of paper sheet material and the roll of film sheet material to provide a length of paper sheet material and a length of film sheet material;

simultaneously continuously advancing the length of paper sheet material and the length of the film sheet material to a laminating station comprising a main roll means and a compression roll means defining a nip area therebetween and an adhesive applying means located adjacent the nip area for laminating the film sheet material to be paper sheet material;

continuously applying adhesive material between the paper sheet material and the film material in the nip area;

applying pressure to the paper sheet material and the film sheet material and the adhesive material during passage through the nip area to form a fixed lamination;

passing the length of film sheet material past adjustable tensioning means located between the lamination station and the feed roll means to stretch or relax the length of film material passing therethrough;

continuously adjusting the unwind speed of the film sheet material from the second feed roll to provide a relatively constant tension in the film material between the second feed roll and the adjustable tensioning means;

continuously adjusting the unwind speed of the paper sheet material from the first feed roll to provide a relatively constant tension in the paper material between the first feed roll and the laminating station;

continuously adjusting the rate of lamination web takeup from the laminating station to provide a relatively constant tension in the lamination web immediately downstream of the lamination station;

sampling the distance between fixed indicia on the lamination downstream of the laminating station and generating a control signal representative of that distance; and

adjusting the tensioning means in accordance with the control signal, so as to maintain the distance between indicia on the film sheet material within a predetermined tolerance.

4,572,753

METHOD OF ULTRASONIC WELDING AND APPARATUS THEREFOR

Gary Bach, Appleton, Wis., assignor to The Coca-Cola Company, Atlanta, Ga.

Filed Jul. 12, 1984, Ser. No. 630,190
Int. Cl.[4] B29C *27/08*
U.S. Cl. 156—73.1 **39 Claims**

1. Means for spot welding sheet material comprising:

ultrasonic energy application means for providing ultrasonic vibrational energy to heat said material;

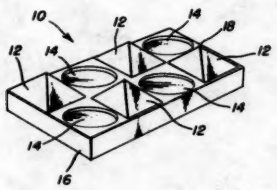
plate means having a planar face with projections extending

therefrom for concentrating said ultrasonic vibrational energy at desired spots to be welded; and

reservoir means adjacent said spots but spaced therefrom for receiving material displaced from juxtaposition with said means for concentrating to thereby strengthen the resulting welds, said reservoir means being recessed below the planar face of said plate means.

39. A method of spot welding sheet material comprising:

ultrasonically applying vibrational energy to said sheet material to heat said material;



concentrating said vibrational energy at spots desired to be welded by applying said ultrasonic energy through projections extending from the planar surface of a plate; and

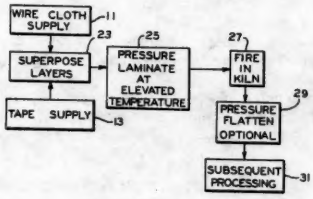
providing reservoirs spaced from but adjacent said spots for facilitating displacement of molten material produced by said heating process to strengthen the resulting welds, said reservoirs being recessed in the planar surface of said plate.

4,572,754

METHOD OF MAKING AN ELECTRICALLY INSULATIVE SUBSTRATE

Terry R. Bloom, Middlebury, Ind., assignor to CTX Corporation, Elkhart, Ind.

Filed May 21, 1984, Ser. No. 612,142
Int. Cl.⁴ C04B *33/26*
U.S. Cl. 156—89 **10 Claims**



1. The method of fabricating an electrically insulative substrate having a glazed porcelain surface for receiving electrical circuitry thereon; comparatively low thermal coefficient of expansion; comparatively high thermal conductivity for heat dissipation; good electrical insulation properties; and sufficient mechanical strength for subsequent use in a microelectronic circuit having surface mounted devices disposed thereon; comprising the step of:

providing a first plurality of porcelain green sheets having a relatively low linear thermal coefficient of expansion matched to the linear thermal coefficient of expansion of the surface mounted devices to be subsequently mounted upon the substrate; and a second plurality of fine mesh wire cloth sheets for mechanical strength and high thermal conductivity;

interleaving the sheets so that every pair of fine mesh wire cloth sheets is separated by at least one porcelain green sheet to provide electrical insulation between the wire cloth sheets; and at least one outermost layer is a porcelain green sheet;

compressing the interleaved porcelain green sheets and the wire cloth sheets against one another at a somewhat elevated temperature with sufficient pressure to form a laminated composite substrate still in a green state; and

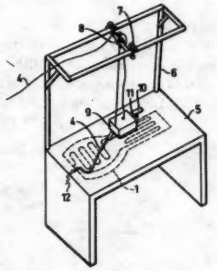
kiln firing the compressed interleaved sheets at a further elevated temperature sufficient to form at least one glazed porcelain surface suitable for receiving further electrical circuitry thereon.

4,572,755

METHOD OF MANUFACTURING AN ELASTIC AND FLEXIBLE BACKING

Vilgot Ahs, Koppom, Sweden, assignor to Töcksfors Verkstads AB, Töcksfors, Sweden

Filed Sep. 29, 1982, Ser. No. 427,186
Claims priority, application Sweden, Oct. 7, 1981, 8105916
Int. Cl.⁴ B32B *31/00, 31/20*
U.S. Cl. 156—166 **4 Claims**



1. A method for laying out and fixing a thin electric conductor on an elastic and flexible backing, said backing defining a structural body provided with an uninterrupted planar surface for heating seats and backs of chairs, cushions, mattresses and the like, comprising the steps of advancing the conductor out of a magazine, forming the conductor to a substantially permanent zigzag pattern constituting a strand, guiding the strand at a selected feed speed by feed means to the structural body so as to attach said strand to said planar surface of the structural body, moving the feed means along the structural body in a pattern desired for the completed product at a speed such that the relative speed between the strand and the structural body is substantially zero so that said strand is retained in the pattern desired on the planar surface by movement of said feed means, and fixedly attaching the strand formed of the conductor to the structural body by an adhesive.

4,572,756

DRIP IRRIGATION SYSTEM EMPLOYING ADJACENTLY ARRANGED FLOW-RESTRICTING PASSAGES

Richard D. Chapin, 368 N. Colorado Ave., Watertown, N.Y. 13601

Division of Ser. No. 364,229, Apr. 1, 1982, Pat. No. 4,534,515. This application Jan. 16, 1985, Ser. No. 691,942
Int. Cl.⁴ B29C *53/00*
U.S. Cl. 156—203 **20 Claims**

1. Apparatus for manufacturing an elongated fluid-distributing hose made from an elongated plastic film and at least one plastic bead, said apparatus comprising:

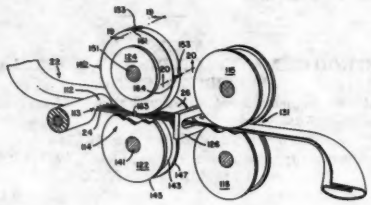
means for moving the film in a desired direction that is essentially parallel to the longitudinal axis of the film;

means for orienting the film to expose one of the two surfaces of the film along one of the longitudinal margins of the film;

extrusion nozzle means for extruding the at least one plastic bead, said nozzle means oriented relative to said one sur-

face of the film so that said bead is disposed on said one surface essentially parallel to the longitudinal axis of the film;

molding means for periodically creating a permanent depression in said at least one bead;



folding means for folding the film about its longitudinal axis so that the other of the two surfaces of the film along the other of the longitudinal margins of the film comes into contact with said at least one bead; and

means for securing the other margin to said at least one bead.

4,572,757

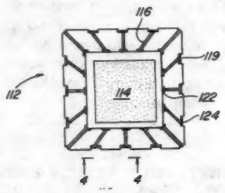
METHOD OF MAKING A MICROCIRCUIT SUBSTRATE

Vincent A. Spadafora, Churchville, Pa., assignor to The Jade Corporation, Southhampton, Pa.

Filed Jan. 23, 1984, Ser. No. 573,084

Int. Cl.[4] B32B *31/20;* H01L *23/48*

U.S. Cl. 156—252 4 Claims



1. Method of making individual microcircuit ceramic substrates, comprising the steps of:

(a) constructing an integral array of a plurality of individual substrates on a sheet of ceramic material,

(b) forming rectangular holes in the ceramic material along score lines which define the periphery of individual substrates,

(c) separating the individual substrates from the array by breaking the array along the score lines to yield individual substrates having semi-rectangular openings around the periphery of each substrate,

(d) metallizing at least one surface of the semi-rectangular openings, and

(e) compression bonding leads to the substrate at the semi-rectangular openings at temperatures below brazing temperatures.

4,572,758

MACHINERY AND METHOD FOR ATTACHING DRINKING STRAWS IN PROTECTIVE COVERINGS TO BEVERAGE CONTAINERS

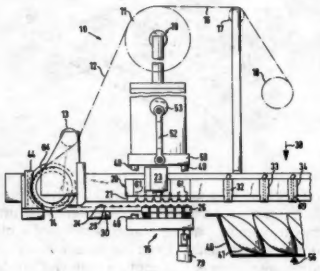
Rudolf Wild, Heidelberg-Eppelheim, Fed. Rep. of Germany, assignor to Indag Gesellschaft fur Industriebedarf mbH, Heidelberg-Eppelheim, Fed. Rep. of Germany

Filed Dec. 28, 1984, Ser. No. 687,212

Claims priority, application Fed. Rep. of Germany, Feb. 13, 1984, 3401214

Int. Cl.[4] B32B *31/00*

U.S. Cl. 156—256 50 Claims



1. A process for attaching a batch of drinking straws in straw packages on a tape of drinking straw packages with the drinking straws substantially parallel and substantially equidistant from each other and substantially perpendicular to the length of the drinking straw package tape to beverage containers, comprising:

supplying a batch of drinking straws on a tape, each drinking straw enclosed in a protective covering;

exposing an adhesive on one surface of the tape;

conveying a batch, comprising a predetermined number greater than one, of the drinking straw packages on the tape to a cutting station;

detaching the batch of drinking straw packages from the tape and each other substantially simultaneously;

conveying the batch of separated straw packages to an affixing station; and

affixing the batch of separated drinking straw packages to a batch of beverage containers substantially simultaneously.

4,572,759

TROIDE PLASMA REACTOR WITH MAGNETIC ENHANCEMENT

David W. Benzing, San Jose, Calif., assignor to Benzing Technology, Inc., Santa Clara, Calif.

Filed Dec. 26, 1984, Ser. No. 685,499

Int. Cl.[4] H01L *21/306;* B44C *1/22;* C03C *15/00;* C23F *1/02*

U.S. Cl. 156—345 27 Claims

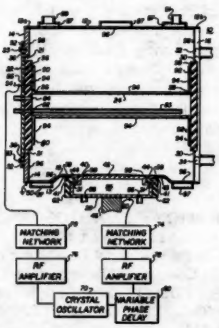
1. An apparatus for dry plasma processing of semiconductor wafers, and the like comprising:

a chamber, being formed by walls which are electrically conductive and adapted to be electrically connected to a point of reference potential;

an electrically conductive cathode being mounted within said chamber and electrically isolated from the walls thereof, said cathode being connected to a first source of electric potential;

a wafer stage being mounted to said chamber wall such that a semiconductor wafer may be removably mounted on said wafer stage, said wafer when so mounted being located within said chamber; said wafer stage being electrically isolated both from said chamber walls and said cathode and being adapted to be connected to a second source of electric potential;

means for the introduction into and removal of gas and gaseous by products from said chamber such that a plasma may be formed within said chamber in response to activation of said first source of electric potential; and



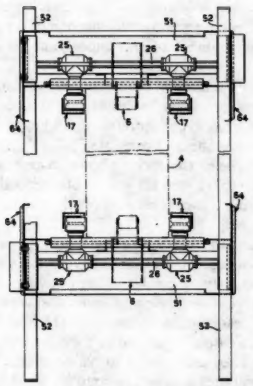
means for establishing said second electric potential at a different value from said first electric potential.

4,572,760

TAPING MACHINE WITH EASILY REMOVABLE AND REATTACHABLE VERTICAL COMPONENTS AND WITH DOUBLING POSSIBILITY

Augusto Marchetti, Piazza Sicilia, 7, 20146 Milano, Italy

Filed Feb. 21, 1984, Ser. No. 582,234
Claims priority, application Italy, Feb. 24, 1983, 20913/83[U]
Int. Cl.⁴ B65B *61/00*
U.S. Cl. 156—468 **6 Claims**



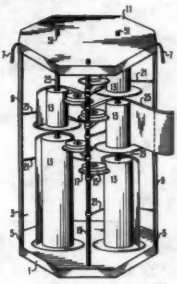
1. Taping machine, comprising a carton support base, a pair of carton conveying units, a lower taping means and an upper taping means, said support base comprising a frame provided with vertical legs which supports a plurality of idle transversal rollers, said conveying units and said lower taping means, two vertical columns extending upwardly from the frame suitable for supporting and guiding a support crossbar for the upper taping means, characterized in that said legs are coupled to the frame in passing-through way and releasably clamped thereto in adjustable position and said columns are releasably fixed to support brackets of limited vertical extension fixed to the frame.

4,572,761

PAPER DISPENSING APPARATUS

James E. Phillips, Sr., R.D. #1, 320 Disbrow Hill Rd., Hightstown, N.J.

Filed Jul. 6, 1984, Ser. No. 628,648
Int. Cl.⁴ B32B *31/18*
U.S. Cl. 156—511 **2 Claims**



1. A paper and tape dispensing apparatus for rolls of paper comprising:

A platform member;

A housing member attached to and extending upward from said platform member;

A top member;

Two telescopically detachable shafts of equal length attached to the platform and top members to support respective different widths of paper rolls;

A shaft attached to the platform and top members to support a plurality of adhesive tape rolls;

Cutting means for providing specified lengths of paper with an adhesive tape applied to an edge of said paper;

Spring members for securing said paper rolls;

A washer and adjustable collar assembly for positioning said paper rolls along said shafts;

An adjustable platform assembly for positioning said adhesive tape rolls along said shafts;

Wheels attached to the rear of said platform member;

Handle means attached to the housing member for rotating the platform member about the wheels to transport the paper dispensing apparatus supported only by the wheel means; and

A storage bin mounted on the rear of said housing member.

4,572,762

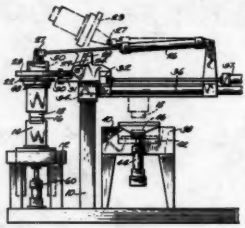
LOST FOAM PATTERN ASSEMBLY EQUIPMENT

John H. Winston, Menomonee Falls, Wis., assignor to Outboard Marine Corporation, Waukegan, Ill.

Filed Feb. 27, 1984, Ser. No. 583,661
Int. Cl.⁴ B05C *1/02*
U.S. Cl. 156—556 **16 Claims**

1. A machine for assemblying foam pattern sections, said machine comprising an upper retainer for holding an upper pattern section in a horizontal position with a surface which is to be glued facing downwardly means mounting said upper retainer for rotary movement between a horizontal position and a generally vertical position, a tank for hot melt adhesive, a glue platen movable between a first position in said tank and a second position above said tank, said platen having therein a raised configuration depicting the configuration of the glue pattern desired on said upper pattern section, means for moving said upper retainer with the pattern section thereon and said platen relative to each other to move said raised configuration into contact with the upper pattern section to transfer adhesive to the upper pattern section, a lower retainer for

holding a lower pattern section, and means for moving said upper and lower retainers relative to each other to move the



lower and upper pattern sections into contact with each other for bonding therebetween.

4,572,763

METHOD AND APPARATUS FOR PERFORMING EPITAXIAL GROWTH OF ZnSe CRYSTAL FROM A MELT THEREOF

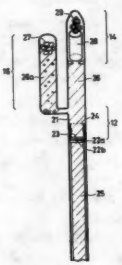
Jun-ichi Nishizawa, Sendai, Japan, assignor to Zaidan Hojin Handotai Kenkyu Shinkokai, Sendai, Japan

Filed Jul. 13, 1983, Ser. No. 513,294

Claims priority, application Japan, Jul. 14, 1982, 57-123696

Int. Cl.⁴ C30B *9/06*

U.S. Cl. 156—624 **11 Claims**



1. A method of epitaxially growing a ZnSe single crystal from a melt thereof in a quartz ampule having two parts, a first part having a lower crystal substrate portion containing a crystal substrate and an upper vapor pressure controlling portion arranged opposite one another and a second part arranged in parallel with said first part and containing a source crystal, said first and second ampule parts being connected through a connector portion having a smaller cross-sectional area than the cross-sectional area of either said first or second portions, wherein the method comprises the steps of:

providing a solvent Se in first and second parts of a two part quartz ampule, a source crystal in said second part being in said solvent Se;

saturating and dissolving source crystal ZnSe into the solvent Se while laying said quartz ampule in a substantially horizontal position and establishing the temperature of a crystal substrate portion of the first part of said ampule at a higher level than a vapor pressure control portion thereof and the second part of said quartz ampule; then

standing said quartz ampule in a substantially vertical position;

establishing the temperature of said crystal substrate portion at a lower level than the vapor pressure control portion and the second part of said ampule while said ZnSe single crystal is epitaxially growing;

forming a temperature difference between said crystal substrate portion and said second ampule part containing said source crystal;

diffusing the saturated and dissolved ZnSe crystal into said crystal substrate position;

supplying through a thermal isolating means which isolates a source of Zn from the solvent Se, a pressure controlled vapor of a Zn into said Se solvent in said first quartz ampule part during the epitaxial growth of said ZnSe single crystal to thereby minimize deviation from stoichiometry of said growing crystal; and

removing heat from said growing crystal from a bottom of said crystal substrate during said epitaxial growth of said crystal.

4,572,764

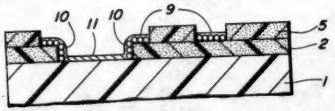
PREPARATION OF PHOTOFORMED PLASTIC MULTISTRATE BY VIA FORMATION FIRST

Roxy N. Fan, E. Brunswick, N.J., assignor to E. I. Du Pont De Nemours and Company, Wilmington, Del.

Filed Dec. 13, 1984, Ser. No. 681,189

Int. Cl.⁴ B44C *1/22*; B29C *17/08*; G03C *5/00*; B05D *5/12*

U.S. Cl. 156—630 **28 Claims**



1. A process for preparing a multilayer printed circuit having conductive interconnections which comprises:

(a) laminating to a substrate bearing an electrically conductive surface or circuit pattern a layer of a photosensitive composition which is tacky or becomes tacky upon exposure, the layer optionally having a removable cover sheet;

(b) exposing the laminate to actinic radiation through a via image which is related to the underlying circuit pattern if present leaving removable via image areas overlying at least one segment of the underlying conductive circuit pattern;

(c) optionally removing the removable via image areas of the photosensitive layer in either the exposed or unexposed areas with a solvent therefor or peeling apart by removal of the cover sheet, if present:

(d) laminating to the tacky photosensitive layer remaining from step (b) or step (c) a layer of a second photosensitive composition, the layer optionally having a removable cover sheet;

(e) exposing the laminate of step (d) to actinic radiation through a registered circuit image pattern which is related to the underlying circuit pattern having at least one segment thereof overlying at least one segment of the via image area resulting from step (b) and the underlying conductive circuit pattern to form an image surface having nontacky areas and removable circuit image areas;

(f) removing the removable circuit image areas of the photosensitive layer of step (d) in either the exposed or unexposed areas with a solvent therefor, or peeling apart by removal of the cover sheet, if present;

(g) removing the removable via image areas of the lower photosensitive layer, if present, with a solvent therefor;

(h) embedding finely divided metal, alloy, or plating catalyst material to the tacky image areas;

(i) optionally curing the laminate by exposing the laminate to actinic radiation, and/or heating;

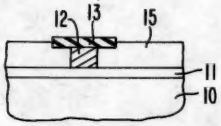
(j) plating electrolessly the metallized or catalyzed vias, the uncovered segments, and overlying circuit image to form an electrically conductive circuit pattern interconnected with electrically conductive vias.

4,572,765

METHOD OF FABRICATING INTEGRATED CIRCUIT STRUCTURES USING REPLICA PATTERNING

Robert L. Berry, San Mateo, Calif., assignor to Fairchild Camera & Instrument Corporation, Mountain View, Calif.

Filed May 2, 1983, Ser. No. 490,622
Int. Cl.[4] B44C 1/22; C03C 15/00, 25/06
U.S. Cl. 156—643 29 Claims



1. A method of defining narrow regions in an underlying semiconductor structure comprising:

depositing a first layer of material having selected etching characteristics on the underlying semiconductor structure;

depositing a second layer of material having different etching characteristics from the first layer on the first layer;

removing the first layer and second layer from all of the underlying semiconductor structure except for desired regions eaching having a periphery which includes a narrow region;

etching the first layer inward only from the periphery to the narrow region to thereby remove all of the first layer except for the narrow region;

coating all of the underlying semiconductor structure except where overlaid by the first layer with a non-conformal material;

removing all of the non-conformal material except where overlaid by the second layer; and

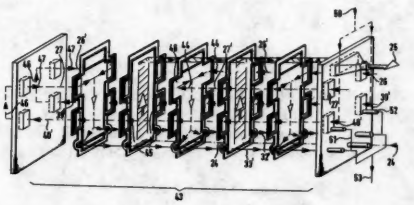
removing the first layer to thereby define the narrow region in the underlying semiconductor structure.

4,572,766

PLATE EVAPORATOR OR CONDENSER

Michael H. Dimitriou, Bretten, Fed. Rep. of Germany, assignor to W. Schmidt GmbH & Co. K.G., Bretten, Fed. Rep. of Germany

Filed Jun. 2, 1983, Ser. No. 500,350
Claims priority, application Fed. Rep. of Germany, Jun. 2, 1982, 3220774
Int. Cl.[4] B01D 1/22; F28F 3/08
U.S. Cl. 159—28 10 Claims



1. In a plate evaporator or condenser having a plurality of generally rectangular plates each having a length dimension and a width dimension, said plates being arranged in a face-to-face oriented plate series to form a plate stack, adjoining plates being in sealing engagement with one another and defining, together with circumferential seals, alternating chambers for a first fluid to be evaporated and a second fluid to be condensed; the improvement comprising:

(a) more than two parallel spaced beads forming embossed portions of each said plate; said beads projecting solely into each chamber for said first fluid and being oriented parallel to said length dimension; mutually aligned beads of adjoining plates being in contact with one another and dividing each chamber for said first fluid into a plurality of unobstructed channels extending parallel to said length dimension and arranged side by side in a series along and substantially throughout said width dimension; each said channel having a first end and a second end opposite said first end and spaced from said first end in a direction parallel to said length dimension; said first ends being situated along and substantially throughout said width dimension; said second ends being situated along and substantially throughout said width dimension;

(b) a plurality of spaced knubs forming embossed portions of each said plate; said knubs being essentially dot-like protuberances situated between said beads and projecting solely into each chamber for said second fluid; mutually aligned knubs of adjoining plates being in contact with one another; said knubs dividing each chamber for said second fluid into a plurality of unobstructed channels extending parallel to said length dimension and being in communication with one another in a direction parallel to said width dimension;

(c) first and second apertures provided in opposite end zones of said plates; said first and second apertures being spaced from one another in a direction parallel to said length dimension; said first and second apertures each extending substantially throughout said width dimension; said first and second apertures of adjoining plates being mutually aligned so as to form first and second flow channels for said first fluid through said plate stack; said first aperture constituting an inlet for said first fluid into said channels for said first fluid and said second aperture constituting an outlet for said first fluid from said channels for said first fluid; said first aperture being in communication with said first end of each channel for said first fluid, and said second aperture being in communication with said second end of each channel for said first fluid for guiding the first fluid in each channel for said first fluid parallel to said length dimension from the first end of each channel for said first fluid to the second end thereof for effecting a unidirectional flow of the first fluid from said first aperture into said second aperture through said channels for said first fluid substantially throughout said width dimension of each said plate;

(d) first and second lateral enlargements projecting beyond a rectangular outline of each said plate in said end zones between said first and second apertures; and

(e) third and fourth apertures provided in each said first and second lateral enlargement; said third and fourth apertures of adjoining plates being mutually aligned so as to form third and fourth flow channels for said second fluid through said plate stack; said third and fourth flow channels being in communication with said channels of each chamber for said second fluid, said third apertures being arranged for introducing the second fluid into said channels of each chamber for the second fluid in a direction parallel to said width dimension from an edge portion of said plates.

4,572,767

VAPOR GENERATING AND RECOVERY APPARATUS

James W. McCord, 9101 Nottingham Pkwy., Louisville, Ky. 40222

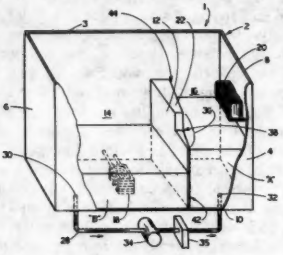
Filed Sep. 28, 1982, Ser. No. 425,167
Int. Cl.[4] B01D 3/00
U.S. Cl. 202—170 14 Claims

1. A vapor generating and recovery apparatus comprising:

a housing having two end walls and two side walls;

a first weir disposed within the housing extending from one side wall to the other side wall dividing the interior of said

housing into two chambers, said weir having at least one side configured in non-parallel relationship to both of the housing end walls, said first weir having means defining a liquid overflow area at a preselected location along the top of said weir for promoting the flow of liquid from one



of the chambers to the other of the chambers, the preselected location of the overflow area being at a location of the first weir furthest from the housing end wall across the chamber from which the liquid flows;

means for condensing vapor in said housing; and

means for vaporizing liquid condensate in said housing.

4,572,768

TREATMENT FOR COPPER FOIL

Adam M. Wolski, Edgewater Park; Chintsai T. Cheng, Hamilton Square; Richard B. Simon, Browns Mills, and Manoj C. Gambhirwala, Edgewater Park, all of N.J., assignors to Square D Company, Palatine, Ill.

Filed Jun. 28, 1985, Ser. No. 750,111

Int. Cl.[4] C25D *5/10, 7/06*

U.S. Cl. 204—15 **8 Claims**

5. In the method of treating copper foil by electrodepositing a dendritic layer of copper on one side of the foil, electrodepositing a gilding layer of copper on the dendritic layer, electrodepositing a barrier layer over the gilding layer, and electrodepositing a stainproofing layer over the barrier layer, the improvement comprising electrodepositing the barrier layer from a solution containing ions of zinc, nickel, and antimony.

4,572,769

METHOD OF MANUFACTURING TETRAMETHYL AMMONIUM HYDROXIDE

Shumpei Shimizu, Kawasaki, Japan, assignor to Tama Chemicals Co., Ltd., Japan

Filed Oct. 26, 1984, Ser. No. 665,524

Claims priority, application Japan, Nov. 2, 1983, 58-206427

Int. Cl.[4] C25C *1/00*

U.S. Cl. 204—59 R **1 Claim**

1. A method of manufacturing tetramethyl ammonium hydroxide by electrolyzing a tetramethyl ammonium salt in an electrolytic cell the diaphragm of which is prepared from a cation exchange membrane wherein said tetramethyl ammonium salt is tetramethyl ammonium formate prepared by a reaction between trimethylamine and methyl formate in either methyl alcohol or ethyl alcohol, solvent.

4,572,770

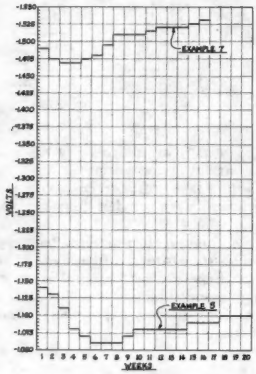
PREPARATION AND USE OF ELECTRODES IN THE ELECTROLYSIS OF ALKALI HALIDES

R. Neal Beaver, Angleton; Carl E. Byrd, Richwood, and Lloyd E. Alexander, Angleton, all of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 499,626, May 31, 1983. This application Jun. 27, 1984, Ser. No. 625,264

Int. Cl.[4] C25B *1/34, 11/10*

U.S. Cl. 204—98 **20 Claims**



12. A process for electrolysis of aqueous solutions of sodium chloride in an electrolytic cell comprising an anolyte compartment and a catholyte compartment separated by a diaphragm to produce an aqueous solution of sodium hydroxide in the catholyte compartment, and chlorine in the anolyte compartcompartment,

wherein the cathode of said process is a low hydrogen overvoltage cathode made by

applying to an electroconductive substrate a coating solution of nickel oxide and ruthenium oxide precursor compounds and an etchant capable of etching the surface of the substrate and/or any previously applied coating, heating to remove volatiles from the so-coated substrate to cause the metal values of the precursor compounds and those etched from the substrate or previous coating to be concentrated and recoated on the substrate or previously applied coating, and further heating, in the presence of oxygen, air or an oxidizing agent, to a temperature sufficient to oxidize the metal values, thereby obtaining on said substrate an electrocatalytically-active heterogeneous metal oxide structure comprising RuO_2 and NiO.

4,572,771

ZINC RECOVERY FROM STEEL PLANT DUSTS AND OTHER ZINCIFEROUS MATERIALS

Willem P. C. Duyvesteyn, Benthuisen, Netherlands, and Mahesh C. Jha, Arvada, Colo., assignors to Amax Inc., Greenwich, Conn.

Filed Jan. 31, 1985, Ser. No. 696,979

Int. Cl.[4] C25B *1/22*

U.S. Cl. 204—118 **5 Claims**

1. In a process wherein a zinc-containing oxide residue also containing iron and lead is leached with hydrochloric acid to provide a pregnant liquor containing zinc which is subsequently recovered by electrolysis as electrolytic zinc, the improvement which comprises,

mixing a charge of finely divided zinc-containing oxide residue containing about 5 to 40% of zinc, about 20 to 60% of iron and about 0.5 to 6% lead with a hydrochloric acid solution in a leaching stage to form a slurry thereof,

the acid concentration corresponding to a pH of less than about 1, and the temperature thereof including the acid concentration being at least sufficient to dissolve said contained zinc and provide a pregnant liquor thereof also containing at least iron and provide an undissolved residue,

separating said pregnant liquor from said undissolved residue,

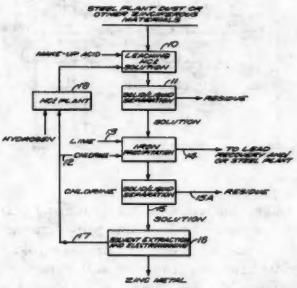
controlling the pH of said pregnant liquor at a pH ranging from about 2 to 4,

oxidizing said solution by passing chlorine gas therethrough to provide an oxidation voltage Eh substantially in excess of 300 mv and ranging up to about 700 mv,

thereby precipitating the contained iron and any lead present,

separating said precipitate from said zinc-containing solution and provide a filtrate thereof,

selectively removing said zinc from said filtrate using an



organic solvent containing an extractant selected from the group consisting of di-(2-ethylhexyl) phosphoric acid, di-2-2ethyl-phosphonic acid, di-(2,4,4-trimethylpentyl) phosphinic acid and tri-butyl phosphate and provide a substantially pure zinc solution thereof,

selectively stripping said zinc from said organic solvent using an aqueous medium selected from the group consisting of water and a hydrochloric solution and provide an electrolyte of zinc chloride,

subjecting said zinc chloride electrolyte solution to electrowinning,

wherein electrolytic zinc is produced together with free hydrochloric acid and free chlorine,

recycling said free hydrochloric acid to the leaching stage, and

recycling as an oxidant the chlorine gas formed during electrowinning to the pregnant liquor to oxidize the solution to said oxidation voltage level and precipitate at least iron therefrom.

4,572,772

METHOD FOR CLEANING AN ELECTRODE

James R. Peterson, Garland, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Nov. 7, 1983, Ser. No. 549,137

Int. Cl.[4] C25F *1/00, 7/00*; C23C *14/00*; B23K *11/16*

U.S. Cl. 204—141.5 **5 Claims**

1. A device for cleaning a contaminated wire dispensing electrode, comprising:

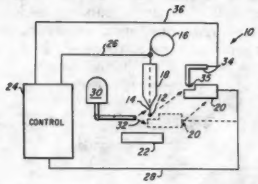
a work area at which wires dispensed by said wire dispensing electrodes are attached to a work piece;

a cleaning electrode located away from said work area

means for periodically positioning the wire dispensing electrode adjacent said cleaning electrode;

means for introducing a noble gas into the region between the wire dispensing electrode and the cleaning electrode;

means for forming a glow discharge between said cleaning electrode and the wire dispensing electrode,



and means for biasing the cleaning electrode negatively relative to said wire dispensing electrode.

4,572,773

ELECTROPLATING APPARATUS

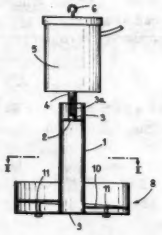
Jean-Francois Fallot, Bienne, Switzerland, assignor to Egatec S.A., Canton of Bern, Switzerland

Filed Feb. 22, 1985, Ser. No. 704,262

Claims priority, application Switzerland, Mar. 20, 1984, 1396/84

Int. Cl.[4] C25D *17/22*

U.S. Cl. 204—201 **4 Claims**



1. Electroplating apparatus comprising a portable vibrator having a body and a power take-off member, an elongate element to one end of which is secured said power take-off member of said vibrator, a container adapted to receive workpieces to be electroplated, said container being carried at the other end of said elongate member and said body of the vibrator being provided with means for detachably supporting the apparatus which enable it to be alternatively positioned above one of a plurality of electroplating treatment vessels in order to easily attach and transport said apparatus between said vessels for alternative use therewith.

4,572,774

APPARATUS FOR PRODUCTION OF HYDROGEN PEROXIDE

Mark S. Wrighton, Winchester, Mass.; Robert M. Buchanan, Louisville, Ky., and Gary S. Calabrese, Reading, Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Division of Ser. No. 543,574, Oct. 19, 1983, Pat. No. 4,533,443. This application Jan. 7, 1985, Ser. No. 689,490

Int. Cl.[4] C25B *1/30, 9/00, 15/08*

U.S. Cl. 204—238 **10 Claims**

1. An apparatus for the production of hydrogen peroxide, the apparatus comprising:

(a) an electrolytic cell comprising:

(i) a chamber filled with an electrolyte solution;

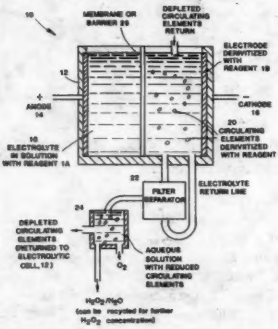
(ii) an anode;

(iii) a cathode;

(iv) means for generating a current between the anode and cathode; and

(v) a barrier separating the cell into an anodic and a cathodic compartment;

(b) a plurality of high surface area elements carrying a surface derivatized quinone catalyst which is capable of undergoing reduction upon immersion in the cathodic compartment of the electrolytic cell;


MEMBRANE OR BARRIER 20
DEPLETED CIRCULATING ELEMENTS RETURN
ELECTRODE DERIVITIZED WITH REAGENT 1B
ANODE 14
CATHODE 16
20 CIRCULATING ELEMENTS DERIVITIZED WITH REAGENT 1B
ELECTROLYTE IN SOLUTION WITH REAGENT 1A
FILTER SEPARATOR
ELECTROLYTE RETURN LINE
DEPLETED CIRCULATING ELEMENTS (RETURNED TO ELECTROLYTIC CELL, 12)
AQUEOUS SOLUTION WITH REDUCED CIRCULATING ELEMENTS

(c) means for separating the elements from the electrolytic cell upon reduction; and

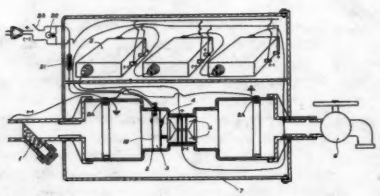
(d) a production chamber wherein the separated reduced elements can react with oxygen in an aqueous environment to produce hydrogen peroxide.

4,572,775

APPARATUS FOR STERILIZING FLUIDS

Juan G. Paniagua, Alejandrina N. 1609 Guadalajara, Jalisco, Mexico

Filed Feb. 5, 1982, Ser. No. 346,304
Int. Cl.⁴ C25B *15/02, 15/08;* B01D *35/06*
U.S. Cl. 204—229 **6 Claims**



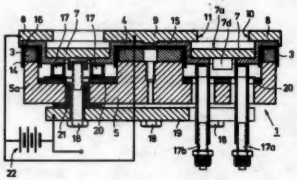
1. Apparatus for sterilizing bacteria-containing liquids, comprising a conduit defining a given longitudinal flow path for a bacteria-containing liquid, a filter in the upstream end of the conduit for filtering large particles from the liquid when said liquid flows in the conduit, a flow sensor in the conduit at a first conduit location downstream of said filter for sensing any flow of liquid past said first location, electrical current discharge means located in the conduit between longitudinally spaced second and third conduit locations downstream of said first location and being energizable to pass an electrical current laterally through any liquid between the second and third conduit locations, an electrical current source, and switch means operable by said flow sensor which, in response to the sensing of liquid flow, connects said current source in energizing relationship with said discharge means, said current source being controllable to cause the current passed by said discharge means through the liquid to kill the bacteria in said liquid and thereby sterilize the liquid, the flow sensor including a hinged gate which is arranged to be pivoted out of an obstructing position in the conduit by its force of flowing liquid impinging thereon and into a position that operates the switch means wherein the electrical current discharges means comprises a spaced pair of grids defining a constricted passage for liquid therebetween, each grid being electrically connected to a corresponding output terminal of the electrical current source.

4,572,776

MAGNETRON CATHODE FOR SPUTTERING FERROMAGNETIC TARGETS

Hans Aichert, Hanau am Main; Jörg Kieser, Albstadt, and Reiner Kukla, Hanau, all of Fed. Rep. of Germany, assignors to Leybold-Heraeus GmbH, Cologne, Fed. Rep. of Germany

Filed Dec. 5, 1984, Ser. No. 678,597
Claims priority, application Fed. Rep. of Germany, Dec. 5, 1983, 3343904
Int. Cl.⁴ C23C *14/34*
U.S. Cl. 204—298 **8 Claims**



1. In a magnetron cathode for sputtering ferromagnetic targets, the improvement comprising providing the basic cathode body with a magnet system comprising a yoke and magnet poles of opposite polarity disposed on the yoke, concatenated on the circumference and lying one inside the other, with which poles, pole shoes consisting at least partially of target material and having emergence surfaces similar to the configuration of the magnet poles are associated, behind which emergence surfaces is deposed in the depth direction of the system, leaving two circumferential air gaps, a target of ferromagnetic metal concatenated on the circumference and having a sputtering surface, said magnet poles and target not overlapping in regard to their projection surfaces in a plane parallel to the sputtering surface, and said pole shoes and target connected electrically with one another, and said pole shoes being separated from the magnet poles each by a distance "S" in which a nonferromagnetic medium is situated, and the magnet poles being positioned in an area which extends in the depth direction of the system from a plane passing through the sputtering surface of the target, and deposed between the pole shoes and the target on the one hand and the magnet poles on the other, a heat-conducting metal body, which body is in communication with at least one coolant passage and which body consists of a nonferromagnetic material.

4,572,777

RECOVERY OF A CARBONACEOUS LIQUID WITH A LOW FINES CONTENT

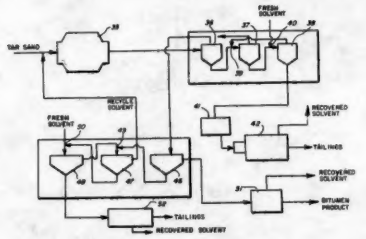
Lawrence B. Peck, Glenn Ellyn, Ill., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Continuation-in-part of Ser. No. 449,607, Dec. 14, 1982. This application Feb. 29, 1984, Ser. No. 584,719
Int. Cl.⁴ C10G *1/04*
U.S. Cl. 208—11 LE **10 Claims**

1. A method for removing solid fines in an extraction of bitumen from a carbonaceous solid or carbonaceous liquid containing extractable bitumen comprising:

(a) forming a mixture comprising dissolved bitumen, about 5 to about 25 weight % undissolved bitumen, solid particle fines, and solvent wherein the about 5 to about 25 weight % undissolved bitumen is sufficient to settle from the mixture and remove the solid particle fines;

(b) permitting the undissolved bitumen to settle with at least a portion of the solid fines agglomerating and settling with the undissolved bitumen to form a lower solid phase;



(c) separating an upper dissolved bitumen solvent liquid phase from the lower solid phase; and

(d) separating the dissolved bitumen from the solvent.

4,572,778
HYDROPROCESSING WITH A LARGE PORE CATALYST

John W. Ward, Yorba Linda, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Filed Jan. 19, 1984, Ser. No. 572,692
Int. Cl.[4] C10G *45/08, 67/02*
U.S. Cl. 208—89 **41 Claims**

1. A catalytic process wherein a hydrocarbon oil containing asphaltenes and less than 50 ppmw of contaminant metals is contacted under conditions of elevated temperature and pressure with a catalyst comprising nickel and tungsten active metal components on a porous support material comprising gamma alumina, said catalyst having at least about 60 percent of the total pore volume distributed in pores of diameter from about 180 to about 240 angstroms, with essentially all pores being of diameter greater than about 100 angstroms, and with less than about 10 percent of the total pore volume being in pores of diameter greater than 300 angstroms, said catalyst having a surface area greater than about 100 m^2/gram, and wherein the effluent hydrocarbon oil contains less asphaltenes than said hydrocarbon oil.

4,572,779
PROCESS FOR THE DEWAXING OF HYDROCARBON FRACTIONS

Kazuyoshi Iwayama, Kamakura; Takehisa Inoue, Tokyo; Kimio Sato, Chiba; Norio Hayakawa, Ichihara, and Masaki Fujii, Chiba, all of Japan, assignors to Toray Industries, Inc. and Fuji Oil Co., Ltd., both of Tokyo, Japan

Filed Feb. 10, 1984, Ser. No. 579,171
Claims priority, application Japan, Feb. 10, 1983, 58-19629; Apr. 8, 1983, 58-60682
Int. Cl.[4] C10G *45/64*
U.S. Cl. 208—111 **21 Claims**

1. A process for dewaxing a hydrocarbon fraction comprising contacting a hydrocarbon fraction with hydrogen in the presence of a catalyst comprising a zeolite having an X-ray diffraction pattern as shown in Table 1 and mesitylene adsorption of not less than 1.8 wt%.

12. The process according to claim 1, wherein the zeolite is obtained by providing an aqueous reaction mixture of SiO_2, Al_2O_3, an alkaline source as OH^-, and a carboxyl group-containing organic compound having the following composition:

SiO_2/Al_2O_3	20–60
H_2O/SiO_2	5–100
OH^-/SiO_2	0.1–0.35

-continued

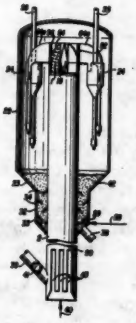
A/Al_2O_3	1.0–100

wherein A represents the carboxyl group-containing organic compound, and reacting the mixture until crystals are produced.

4,572,780
MULTISTAGE STRIPPER FOR FCC UNIT WITH CATALYST SEPARATION BY SPINNING

Hartley Owen, Belle Mead, and Klaus W. Schatz, Skillman, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Oct. 22, 1984, Ser. No. 663,104
Int. Cl.[4] C10G *11/18; F27B 15/00*
U.S. Cl. 208—161 **16 Claims**



1. A fluid catalytic cracking method comprising the steps of:

passing hydrocarbon feed and catalyst into an upstream end of a riser conversion zone to produce a gasiform mixture of catalyst and cracked hydrocarbon exiting at a downstream end of said riser located within a fluid catalytic cracking reactor, wherein said riser is a vertically disposed elongated tubular conduit, wherein said riser terminates within a confined vessel within said reactor;

spinning said mixture within said riser by a means for spinning located within said riser at said downstream end thereof, around the longitudinal axis of said riser to thereby form a spun mixture, wherein said spinning means comprises a plurality of fixed spaced apart sloping baffles provided within said riser;

passing said spun mixture directly to a means for deflecting said catalyst which separates a major portion of said catalyst from said cracked hydrocarbons, wherein said spun mixture is directed by said baffles directly to said deflecting means located within said confined vessel,

passing said separated catalyst directly to said confined vessel comprising a first catalyst stripping zone for contacting said separated catalyst with stripping gas, said confined vessel comprising side walls attached to a top member and a bottom discharge member further comprising means for withdrawing particles of separated catalyst, and

admitting stripping gas, to said first catalyst stripping zone, for directing hydrocarbon vapors upwardly to promote separation of catalyst from hydrocarbon vapors.

4,572,781

SOLVENT DEASPHALTING IN SOLID PHASE

Julio Krasuk; Rodolfo B. Solari; Luis G. Aquino; Jose V. Rodriguez, and Alejandro Granados, all of Caracas, Venezuela, assignors to Intevep S.A., Caracas, Venezuela

Filed Feb. 29, 1984, Ser. No. 584,955
Int. Cl.[4] C10C *3/00, 3/08*
U.S. Cl. 208—309 **13 Claims**

1. A process for separating substantially dry asphaltenes of high softening point, being accomplished without the use of an added fluxing agent, from heavy hydrocarbon material, comprising the following steps:

(a) a admixing heavy hydrocarbon material containing asphaltenes with a solution of deasphalted oil and an aliphatic hydrocarbon precipitant with five or more carbon atoms in a first mixing zone to form a mixture and to precipitate the asphaltenes in form of fine solid particles;

(b) introducing the mixture from step (a) into a first separation zone and separating said mixture into (i) a first solution of deasphalted oil and precipitant, practically free of asphaltenes, and (ii) a slurry of solid asphaltene particles suspended in a second solution of precipitant and deasphalted oil;

(c) separating the first solution of step (b) to obtain said precipitant and the deasphalted oil almost free of asphaltenes and with a much lower metal content than in the original heavy hydrocarbon material;

(d) introducing the slurry of suspended asphaltenes withdrawn from the first separation zone in step (b) into a second mixing zone and washing the slurry with a volume of fresh precipitant to remove entrained deasphalted oil still remaining in the slurry;

(e) introducing the mixture from the second mixing zone of step (d) into a centrifugal decanter to effect a separation of a liquid phase comprising a solution of deasphalted oil in precipitant from a highly concentrated slurry of solid asphaltenes impregnated with a small fraction of entrained solvent;

(f) recycling the solution of deasphalted oil in precipitant from the centrifugal decanter of step (e) to said first mixing zone to effect the precipitation of the asphaltenes in step (a);

(g) introducing the concentrated slurry of solid asphaltenes from the centrifugal decanter of step (e), into a closed system dispersion dryer to recover the solvent from the slurry and to obtain a product comprising fine particles of high softening point asphaltenes substantially free of solvent and deasphalted oil; and

(h) recycling the solvent recovered in the closed system dispersion dryer of step (g) to the second mixing zone of step (d).

4,572,782

LOADING DEVICE FOR GRANULAR MATERIAL

John H. Smith, Lamar, and Otis Logan, Lynchburg, both of S.C., assignors to Southern AG., Inc., S.C.

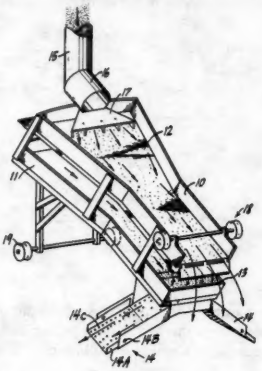
Filed Dec. 20, 1984, Ser. No. 684,026
Int. Cl.[4] B07B *1/00*; B65G *67/00, 11/00*
U.S. Cl. 209—236 **7 Claims**

1. A device for loading granular material into a container and evenly distributing any foreign matter carried therein comprises:

an upper chute and a lower chute arranged in tandem one above the other, the upper chute having a floor which includes at least partly over the length thereof a screen for passing the foreign matter through to the lower chute;

means for introducing a grain flow at an inlet end and for discharging the grain flow at an outlet end of the upper chute into said container; and

means for distributing the flow of foreign matter falling through to the lower chute from the upper chute transverse to the grain flow of the upper chute comprising a pair of wings extending at an angle to the center line of the lower chute and at an angle to a vertical plane through the center lines of the upper and lower chutes, said wings



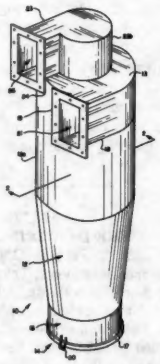
having bottom panels including means for distributing the flow of foreign matter across a width of the container.

4,572,783

CYCLONIC SEPARATOR WITH SCREEN AND BALL CHECK

Cedric H. Watson, Mayfield Hts., Ohio, assignor to Aquatech, Inc., Cleveland, Ohio

Filed Jan. 28, 1985, Ser. No. 695,680
Int. Cl.[4] B04C *5/00*
U.S. Cl. 210—109 **11 Claims**



1. A cyclonic device for separating entrained matter from a fluid stream under pressure comprising a combination of a vortex chamber, a filter member and a float, said vortex chamber being adapted to cause centrifugal separation of the entrained matter and having inlet and outlet means for providing a flow of the fluid stream first downwardly and then in an ascending vortex, said filter member being disposed in said vortex chamber and defining a region through which said ascending vortex flows and surrounding said float, said float being freely and buoyantly displaceable upwardly to close said outlet means as separated matter accumulates in said chamber.

11. A device for centrifugally separating entrained matter from a fluid stream under pressure comprising a cyclone chamber having a longitudinally upright cylindrical portion and a frusto-conical portion subjacent said cylindrical portion, the fluid stream enters said cyclone chamber through an inlet

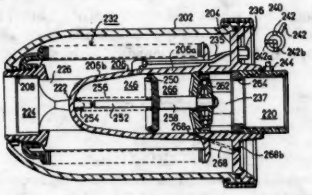
associated with said cylindrical portion and flows with a downward swirling action through said frusto-conical portion then upwardly in an ascending vortex to a chamber outlet, said ascending vortex having a vertex at said apical end of said conical portion, said swirling action causing centrifugal separation of relatively denser entrained matter from the fluid stream and said denser matter accumulates in said frusto-conical portion, filter means disposed in said cyclone chamber and defining a region through which said ascending vortex flows for filtering relatively less dense entrained matter from the fluid stream as the fluid stream enters said ascending vortex, and float means for closing said chamber outlet, said float means being positively buoyant with respect to the separated matter and freely displaceable upwardly as separated matter accumulates in said conical portion, said filter means loosely constraining said float means to a direction of movement generally axial with said ascending vortex towards said chamber outlet.

4,572,784

MULTIPLE-DISC FILTERS

Mordeki Drori, 89 Zahal St., Kiron, Israel

Filed Oct. 11, 1984, Ser. No. 659,674
Claims priority, application Israel, Oct. 28, 1983, 70079
Int. Cl.⁴ B01D *25/30*
U.S. Cl. 210—133 **15 Claims**



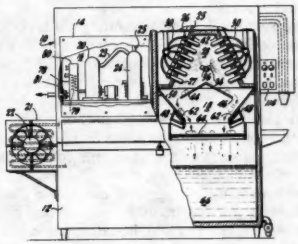
1. A fluid filter including a housing having means defining inlet and outlet ports and a cylindrical filter body extending longitudinally within said housing, characterized in that said housing includes an outer housing section of generally tubular configuration open at both its ends; an inner housing section including first and second longitudinally-extending tubular members and an end plate at one end of said first tubular member and securable to means defining a first open end of said outer housing section; and means on the outer face of said first and second tubular members for supporting said cylindrical filter body; both said end plate and said one end of said first tubular member being open and constituting one of said filter ports; the opposite end of said first tubular member being closed and terminating short of said outer housing section; said second tubular member being open at both ends, with one end longitudinally spaced from the closed end of said first tubular member, and the opposite open end received within the second open end of the outer housing section and constituting the other of said filter ports; means defining a first passageway through the wall of said first tubular member between its closed end and said end plate, establishing communication between said one filter port and the outer face of said filter body; and means defining a second passageway between said closed end of the first tubular member and the adjacent open end of the second tubular member for establishing communication between the outer face of said filter body and said second tubular member constituting the other of said filter ports.

4,572,785

WATER PURIFIER UNIT

Melvin Braaten, 110 Cherokee Ave., Bismark, N. Dak. 58501

Filed Mar. 29, 1984, Ser. No. 594,752
Int. Cl.⁴ C02F *1/22, 1/32;* B01D *9/04*
U.S. Cl. 210—181 **24 Claims**



1. A water purifier comprising:

a crystallizer chamber having a plurality of freeze elements in said chamber;

a water supply conduit having at least one fine spray nozzle directed at said freeze elements;

a pressurized water supply means for delivering contaminated water from a contaminated water source through said spray nozzle;

means for periodically chilling said freeze elements to a sub-freezing temperature, when said water supply means directs a fine droplet spray at said freeze elements;

means for periodically heating said freeze elements for releasing ice shells accumulated on said freeze elements;

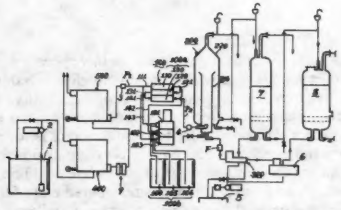
collection means for collecting ice shells released from said freeze elements, wherein said crystallizer chamber has a pair of opposed downwardly and outwardly sloping interior walls from which perpendicularly project said plurality of freeze elements.

4,572,786

OILY WATER SEPARATING APPARATUS FOR THE SHIP

Isao Endo, Tottori, Japan, assignor to Yks Co., Ltd., Osaka, Japan

Filed Jul. 25, 1984, Ser. No. 634,362
Claims priority, application Japan, Aug. 11, 1983, 58-147446
Int. Cl.⁴ B03D *3/06;* B01D *43/00;* B01F *3/04*
U.S. Cl. 210—188 **18 Claims**



1. A water treatment apparatus for treating filthy water having such as oil, suspension substance, which comprises a flocculating apparatus having mixing apparatus for flocculant and water and flocculant supplying system, a pressurized floating separating tank floating and separating the flock under pressure receiving the fluid from the flocculating apparatus, a gas and liquid mixing and dissolving apparatus leading the bubble water into the fluid from the flocculating apparatus

connected to the lower part of the pressure floating separating tank,

the mixing apparatus which includes an inlet cylinder portion for receiving fluids to be mixed as introduced thereinto, and first spiral flow passage members having first spiral flow passages directed therearound through more than 360° and connected to a forward end of said inlet cylinder portion,

the pressurized floating separating tank comprises, a first cylinder having filthy water inlet at lower portion, a second cylinder concentrically provided with said first cylinder so as to externally cover the latter through a gap and provided purified water outlet at bottom, a filthy matter lead-out pipe having a portion reduced in its diameter and connected to the upper end of the second cylinder, a bubble mixed water lead-in pipe connected at the lower end of the first cylinder,

the gas and liquid mixing and dissolving apparatus which includes a gas and liquid mixing section for introducing and mixing the gas and liquid, a gas dissolving section having second spiral flow passage members connected to a downstream side of said gas and liquid mixing section for forming second spiral flow passages, and a surplus gas separating tank in which the end portion of said gas dissolving section is opened and which is intended to separate and discharge the surplus gas.

4,572,787

ARRANGEMENT FOR CYCLONE ASSEMBLIES FOR CLEANING LIQUID SUSPENSIONS

William Robinson, Odengatan 4, S-114 24 Stockholm, Sweden

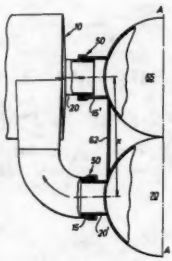
PCT No. PCT/SE84/00066, § 371 Date Oct. 12, 1984, § 102(e) Date Oct. 12, 1984, PCT Pub. No. WO84/03236, PCT Pub. Date Aug. 30, 1984

PCT Filed Feb. 24, 1984, Ser. No. 666,958

Claims priority, application Sweden, Feb. 24, 1983, 8301045

Int. Cl.⁴ B01D *21/26*; B04C *5/28*

U.S. Cl. 210—512.2 **7 Claims**



1. A package of hydrocyclones for incorporation in batteries of such cyclones and which are intended for cleaning liquids, said hydrocyclones comprising conventionally elongated, conically tapering elements, each element having a widened base with a tangential inlet for liquid which is to be cleaned, namely the inject, and also having two outlets which are coaxial with the element, one at the base for cleaned liquid, namely the accept, and one at the opposite, tapered end of the element for liquid separated out, namely the reject, collecting conduits for respectively supplying the inject and conducting away the accept and the reject, the hydrocyclones throughout at least part of the package being parallel-connected and connected to said collecting conduits, the cyclones in the package extending mutually parallel and in a substantially common plane on either side of said collecting conduits for said inject and said accept disposed in the center of the package and comprising an inject chamber defined by said inject conduit and an accept chamber defined by said accept conduit, each cyclone having an accept outlet and an inject inlet which are mutually parallel and each formed as one part of a pipe coupling of the male-female kind, said inject and accept collecting conduits being equipped with corresponding mutually parallel pipe coupling parts for coacting in push-in engagement with the coupling parts on each cyclone to put the accept outlet and the inject inlet of each cyclone in communication respectively with the accept chamber and the inject chamber of said inject and accept collecting conduits, the opposite, reject outlet ends of the cyclones being releasably connected to one of said reject collecting conduits disposed at each end of the cyclone package in parallel with the central inject and accept collecting conduits, such that each separate cyclone can be released at its reject end for repairs or replacement independently of the other cyclones, and pulled out in its longitudinal direction free from the coupling parts on the inject and accept conduits, and removed from the package.

4,572,788

TREATMENT OF CONTAMINATED STRETFORD SOLUTION

Richard A. Wolcott, Richwood, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 474,403, Mar. 11, 1983, Pat. No. 4,518,504. This application Dec. 24, 1984, Ser. No. 686,110

The portion of the term of this patent subsequent to May 24, 2000, has been disclaimed.

Int. Cl.⁴ B01J *41/00*

U.S. Cl. 210—670 **10 Claims**

1. A method for removing vanadate values from an alkaline Stretford Process solution, said method comprising

contacting said Stretford Process solution with an anion exchange resin which takes up vanadate values, and

removing said Stretford Process solution from said anion exchange resin, leaving vanadate values in said anion exchange resin.

4,572,789

DRILLING FLUID ADDITIVES

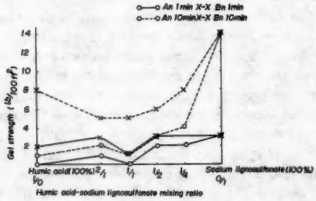
Michio Uemura, Kiryu; Yutaka Sato, Gunma; Masaru Nakamura, Gunma, and Toyoshi Iida, Gunma, all of Japan, assignors to Japan Metals and Chemicals Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 264,040, May 15, 1981, abandoned. This application Mar. 23, 1984, Ser. No. 592,743

Claims priority, application Japan, Nov. 27, 1980, 55-166984; Mar. 30, 1981, 56-46833

Int. Cl.⁴ C09K *7/00*

U.S. Cl. 252—8.5 A **9 Claims**



1. An aqueous clay-based mud drilling fluid additive comprising a metal chelate of an alkali salt of nitrohumic acid, said metal chelate of an alkali salt of nitrohumic acid comprising nitrohumic acid being obtained by nitric acid oxidation of lignite and said metal chelate further comprising at least one compound of a group IVb element selected from the group consisting of titanium, zirconium and hafnium.

4,572,790

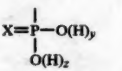
LUBRICATION ADDITIVE FOR AQUEOUS DRILLING FLUIDS

James A. Headley, Missouri City, Tex., assignor to Texaco Inc., White Plains, N.Y.

Filed May 2, 1984, Ser. No. 606,043
Int. Cl.[4] C09K 7/00; C01M 3/32, 3/32
U.S. Cl. 252—8.5 A 14 Claims

1. An aqueous drilling fluid having a pH greater than about 8 and having about 0.2% to about 3% volume of a lubrication additive, said lubrication additive comprising:

a polyolefin in solution having a molecular weight of about 500 to about 2000 and having one or more substituent groups of the formula:



wherein x is sulfur or oxygen, y is 0 or 1 and z is 0 or 1, provided that either y or z=0.

4,572,791

PRODUCTION OF SATURATED AND UNSATURATED SILAHYDROCARBON MIXTURES USING RHODIUM CATALYST, AND TO PRODUCTS PRODUCED THEREBY

Anatoli Onopchenko, Monroeville, and Edward T. Sabourin, Allison Park, both of Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

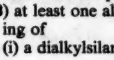
Filed Dec. 6, 1984, Ser. No. 678,792
Int. Cl.[4] C10M 1/14, 1/54
U.S. Cl. 252—46.3 24 Claims

1. A process for the production of a mixture of saturated and unsaturated silahydrocarbons which comprises contacting an admixture comprising

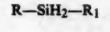
(A) at least one alpha-olefin containing from 2 to about 20 carbon atoms per molecule, and

(B) at least one alkylsilane selected from the group consisting of

(i) a dialkylsilane having the formula



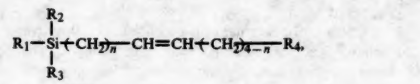
(ii) a trialkylsilane having the formula



and

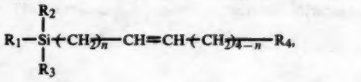
(iii) mixtures thereof,

wherein R and R_1, the same or different, each represent an alkyl radical of from one to 20 carbon atoms per molecule, with a catalyst comprising a homogeneous, monomeric rhodium-containing catalyst having a basicity substantially equal to or less than that provided by a rhodium-containing catalyst having a triphenyl phosphine ligand or a heterogeneous rhodium-containing catalyst in a halogen-free inert solvent, said process conducted at a temperature of from about 30° to about 200° C., a weight ratio of olefin to alkylsilane of from about 0.5 to about 20 to one and a catalyst concentration of from about 1×10^{-5} to about 1×10^{-2} millimoles of catalyst per millimole alkylsilane, to produce a mixture containing saturated silane hydrocarbons and an unsaturated silahydrocarbon having the formula



wherein R_1 represents an alkyl group having from one to about 20 carbon atoms per molecule, R_2 and R_3 each represent the same or different alkyl groups having from 6 to about 20 carbon atoms per molecule, R_4 represents an alkyl group having from one to about 8 carbon atoms per molecule, and n represents an integer from 0 to 4, inclusive with the proviso that the molecular weight of the unsaturated silane hydrocarbon is above 300.

14. A lubricating composition comprising (A) a minor amount of unsaturated silahydrocarbon having the formula



wherein R_1 represents an alkyl group having from one to about 20 carbon atoms per molecule, R_2 and R_3 each represent the same or different alkyl groups having from 6 to about 20 carbon atoms per molecule, R_4 represents an alkyl group having from one to about 8 carbon atoms per molecule, and n represents an integer from 0 to 4, inclusive with the proviso that the molecular weight of the unsaturated silane hydrocarbon is above 300, and (B) a major amount of saturated hydrocarbon, saturated silahydrocarbon or mixtures thereof.

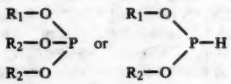
4,572,792

STRIPPER COMPOSITION FOR A PAINT HAVING A POLYSULFIDE BASECOAT

Jacobus L. Muller, Whittier, Calif., assignor to McGean-Rohco, Inc., Cleveland, Ohio

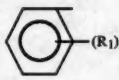
Filed May 29, 1984, Ser. No. 614,990
Int. Cl.[4] C11D 7/30
U.S. Cl. 252—171 15 Claims

1. A paint stripper composition adapted for use in stripping a basecoat from a surface which comprises at least 10 weight percent of a chlorinated solvent selected from the group consisting of methylene chloride, 1,1,1-trichloroethane, perchloroethylene, orthodichlorobenzene and mixtures thereof and from about 0.1 to about 20.0 weight percent of at least one activator selected from the group consisting of lower alkyl phosphite and aryl phosphine, with said activator having the formula



wherein R_1, R_2 and R_3 are the same or different alkyl groups and each contains from one to eight carbon atoms, and $(R_4)_3P$ wherein R_4 is

or



with n=1 to 8.

4,572,793

METHOD FOR THE PRODUCTION OF POSITIVE ACTIVE MATERIAL FOR LEAD STORAGE BATTERIES

Gábor Soóki-Tóth; Pál Horváth; Pálné Jedlovszky; József Keszler, and László Sors, all of Budapest, Hungary, assignors to Villamosipari Kutato Intezet, Budapest, Hungary

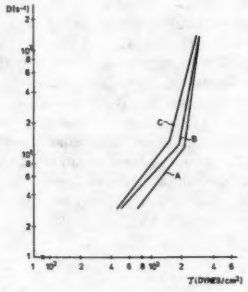
PCT No. PCT/HU83/00029, § 371 Date Jan. 4, 1984, § 102(e) Date Jan. 4, 1984, PCT Pub. No. WO83/04345, PCT Pub. Date Dec. 8, 1983

PCT Filed Jun. 2, 1983, Ser. No. 576,395

Claims priority, application Hungary, Jun. 2, 1982, 1770/82

Int. Cl.[4] C08L *27/18*

U.S. Cl. 252—182.1 5 Claims



1. A method for the production of a positive active material for lead storage batteries comprising PbO and PbO_x powders in an optional ratio, x having a value between 1 and 2 and the metal lead content of the powders being not more than 35 weight percent, wherein an addition material comprising:

(a) glycerine in an amount of 25–125 g/kg of active material;

(b) polytetrafluorethylene in an amount of 0.05–10 g/kg of active material; and

(c) water in an amount of 150–500 g/kg of active material;

is blended with the active material.

4,572,794

ACETONITRILES, THEIR PREPARATION, AND DIELECTRICS AND ELECTRO-OPTICAL DISPLAY ELEMENTS CONTAINING THEM

Rudolf Eidenschink, Dieburg, and Georg Weber, Erzhausen, both of Fed. Rep. of Germany, assignors to Merck Patent Gesellschaft mit beschränkter Haftung, Darmstadt, Fed. Rep. of Germany

Filed Dec. 27, 1982, Ser. No. 453,047

Claims priority, application Fed. Rep. of Germany, Dec. 24, 1981, 3151367

Int. Cl.[4] G02F *1/13;* C09K *3/34*

U.S. Cl. 252—299.2 14 Claims

1. In a liquid-crystalline dielectric comprising at least two liquid-crystalline components, the improvement wherein the liquid-crystalline dielectric comprises at least one acetonitrile compound of the formula

R—Q—Ph—CH_2CN

wherein R is alkyl, alkoxy, or alkanoyloxy, each of up to 8 carbon atoms, and Q is 1, 2 or 3 groups, each bonded to one another in the 1- or 4-position and each being a 1,4-phenylene or 1,4-cyclohexylene group, Ph is a 1,4-phenylene group, with the provisos that when Q is 1 of these groups, it is 1,4-cyclohexylene and that R is alkyl when directly attached to a 1,4-cyclohexylene group.

4,572,795

ODORANT SUBSTANCES

Roman Kaiser, Uster, and Dietmar Lamparsky, Wangen, both of Switzerland, assignors to Givaudan Corporation, Clifton, N.J.

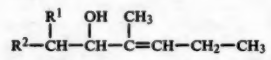
Filed Jan. 26, 1983, Ser. No. 461,054

Claims priority, application Switzerland, Jan. 27, 1982, 491/82

Int. Cl.[4] A61K *7/46;* C07C *33/03, 33/02*

U.S. Cl. 252—522 R 21 Claims

1. A compound of the formula



wherein:

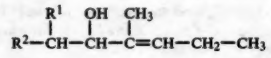
R^1 is selected from the group consisting of hydrogen and methyl;

R^2 is selected from the group consisting of normal or terminally singly branched alkyl or alkenyl groups having four to seven carbon atoms provided that:

(i) when R^1 is hydrogen the alkyl group must have at least five carbon atoms, and

(ii) when R^1 is methyl, R^2 is an alkyl group.

8. An odorant composition comprising an olfactorily effective amount of a compound of the formula:



wherein:

R^1 is selected from the group consisting of hydrogen and methyl;

R^2 is selected from the group consisting of normal or terminally singly branched alkyl or alkenyl groups having four to seven carbon atoms provided that:

(i) when R^1 is hydrogen the alkyl group must have at least five carbon atoms, and

(ii) when R^1 is methyl, R^2 is an alkyl group and,

at least one other olfactory agent.

4,572,796

1,1,4,7-TETRAMETHYL-3-INDANONE, PRODUCT PRODUCED THEREBY AND ORGANOLEPTIC USES THEREOF

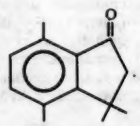
Augustinus G. van Loveren, Rye Brook, N.Y.; Mark A. Sprecker, Sea Bright, N.J.; Patrick Whelan, Matawan, N.J., and Marie R. Hanna, Hazlet, N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Continuation-in-part of Ser. No. 613,570, May 24, 1984, Pat. No. 4,532,357. This application Nov. 14, 1984, Ser. No. 671,407

Int. Cl.[4] C07C *49/69;* A61K *7/46*

U.S. Cl. 252—522 R 6 Claims

1. The 1,1,4,7-tetramethyl-3-indanone having the structure:



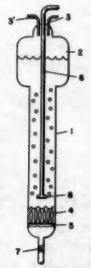
in recovered form.

2. A process for augmenting or enhancing the aroma of a consumable material selected from the group consisting of perfume compositions, colognes and perfumed articles comprising the step of adding to said consumable material an aroma augmenting or enhancing quantity of the 1,1,4,7-tetramethyl-3-indanone defined according to claim 1.

4,572,797
METHOD FOR REMOVING TRACE POLLUTANTS FROM AQUEOUS SOLUTIONS

Gary L. Silver, Centerville, Ohio, assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Mar. 2, 1983, Ser. No. 471,566
Int. Cl.[4] G21F 9/04
U.S. Cl. 252—631 7 Claims



1. A method of substantially removing a trace metallic contaminant from a liquid containing the same, consisting of:

continuously adding an oxidizing agent to a liquid containing up to 10^{-2} ppm of the contaminant to form an oxidized product which precipitates therefrom, with the conditions of the addition being selected to ensure that the precipitation of the oxidized product is homogeneous; and

continuously separating the homogeneous precipitated product from the liquid by allowing said precipitate to crystallize on the walls of a cylindrical container in which the method is carried out;

said contaminant being cobalt, nickel, manganese, thallium, iron (II), platinum, iridium, antimony, strontium, osmium, lead, tin, uranium, or plutonium; and

said oxidizing agent being an alkali or alkaline earth metal hypochlorite or a combination of an alkali or alkaline earth metal sulfite and O_2.

4,572,798
METHOD FOR PROMOTING DISULFIDE BOND FORMATION IN RECOMBINANT PROTEINS

Kirston E. Koths, Berkeley, and Robert F. Halenbeck, San Rafael, both of Calif., assignors to Cetus Corporation, Emeryville, Calif.

Filed Dec. 6, 1984, Ser. No. 679,121
Int. Cl.[4] C07G 7/00; A61K 45/02
U.S. Cl. 260—112 R 19 Claims

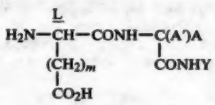
1. A method of oxidizing a fully reduced recombinant protein selected from the group consisting of interferon-beta, interleukin-2 and muteins thereof, whereby cysteines are oxidized preferentially to form the disulfide bridges which correspond to those present in the naturally occurring protein, which method comprises reacting an aqueous solution containing a solubilized form of the recombinant protein at a pH between about 5.5 and 9 in the presence of air with at least an effective amount of an oxidation promoter containing a Cu^{+2} cation.

4,572,799
L-AMINODICARBOXYLIC ACID AMIDES

Paul R. Zanno, Nanuet; Ronald E. Barnett, Suffern, and Glenn M. Roy, Garnerville, all of N.Y., assignors to General Foods Corporation, White Plains, N.Y.

Filed Apr. 15, 1985, Ser. No. 723,600
Int. Cl.[4] C07C 103/52
U.S. Cl. 260—112.5 R 25 Claims

1. A compound represented by the formula:



wherein

A is CO_2R wherein R is alkyl containing 1–3 carbon atoms;

A′ is hydrogen or alkyl containing 1–3 carbon atoms;

Y is $-(CHR_2)_n-R_1$ or $-CHR_3R_4$;

R_1 is cycloalkyl, cycloalkenyl, lower alkyl substituted cycloalkyl or cycloalkenyl, bicycloalkyl, bicycloalkenyl or tricycloalkyl containing up to 10 ring carbon atoms and up to a total of 12 carbon atoms;

R_2 is H or alkyl containing 1–4 carbon atoms;

R_3 and R_4 are each cycloalkyl containing 3–4 ring carbon atoms;

n=0 or 1; and

m=0 or 1;

and food-acceptable salts thereof.

4,572,800
HUMAN LEUKEMIA VIRUS-RELATED PEPTIDES, A PROCESS FOR PRODUCTION THEREOF, ANTIBODIES OF THE PEPTIDES AND A PROCESS FOR PRODUCTION OF THE ANTIBODIES

Fumio Shimizu; Tetsuya Tachikawa; Nobuhiro Ikei; Atunari Noda; Etsuro Hashimura, and Kenichi Imagawa, all of Tokushima, Japan, assignors to Otsuka Pharmaceutical Co., Ltd., Tokyo, Japan

Filed Sep. 23, 1983, Ser. No. 535,118
Claims priority, application Japan, Sep. 30, 1982, 57-171313; Feb. 16, 1983, 58-25233
Int. Cl.[4] A61K 39/00, 37/00; G01N 53/00; C07K 39/00
U.S. Cl. 260—112.5 R 7 Claims

1. An antibody to a human leukemia virus-related peptide represented by formula (1):

R-Pro-Val-Met-His-Pro-His-Gly-Ala-Pro-OH (1)

wherein R is a hydrogen or H-Tyr-; said antibody being isolated from a mammal which has been injected with an antigen which comprises the peptide, as a hapten, covalently bound to a carrier protein via a hapten-carrier coupling agent.

4,572,801

4-CARBAMOYLOXYMETHYL-1-SULFO-2-OXOAZETIDINE DERIVATIVES AND THEIR PRODUCTION

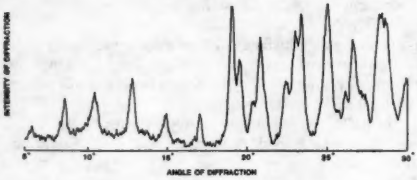
Taisuke Matsuo, deceased, late of Ibaraki, Japan (by Michiko Matsuo, Takeshi Matsuo, Tazuko Mastsuo, heirs); Michihiko Ochiai, Suita, and Shoji Kishimoto, Takarazuka, both of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Continuation-in-part of Ser. No. 405,592, Aug. 5, 1982, which is a continuation-in-part of Ser. No. 326,938, Dec. 3, 1981. This application May 31, 1983, Ser. No. 499,801

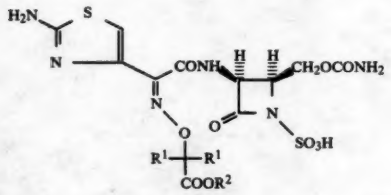
Claims priority, application Japan, Apr. 30, 1982, 57-73728; PCT Int'l Appl., Apr. 30, 1981, WO81/00103; Aug. 21, 1981, WO81/00183; Sep. 24, 1981, WO81/00252; Japan, May 31, 1982, 57-93463

Int. Cl.[4] C07D *417/12;* A61K *31/425;* C07D *205/08, 277/38*

U.S. Cl. 260—245.4 **11 Claims**



1. A member selected from the group consisting of a 1-sulfo-2-azetidinone compound of the formula



wherein R^1 is hydrogen or lower alkyl and R^2 is hydrogen or an ester residue selected from the group consisting of α-(C_{1-4})-alkoxy(C_{1-4})alkyl, (C_{1-4})alkylthiomethyl, pivaloyloxymethyl, α-acetoxyethyl, α-(C_{1-4})-alkoxycarbonyloxy(C_{1-4})-alkyl, tert-butyl, benzhydryl, benzyl, p-nitrobenzyl, p-methoxybenzyl, p-nitrophenyl, β-trimethylsilylethyl, β,β,β-trichloroethyl, tert-butyldimethylsilyl and isopropyldimethylsilyl, said compound having the (3S,4S)-configuration, and a pharmaceutically acceptable salt thereof.

4,572,802

PROCESS FOR RECOVERING ACTINIDES AND/OR LANTHANIDES

Hervé Hubert, Rennes, and Claude Musikas, Bures-Yvette, both of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Nov. 30, 1983, Ser. No. 556,296

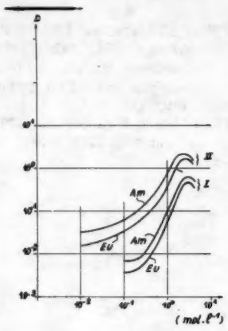
Claims priority, application France, Dec. 1, 1982, 82 20129

Int. Cl.[4] C07F *3/06*

U.S. Cl. 534—12 **11 Claims**

1. A process of recovering trivalent actinides, trivalent lanthanides, or mixtures thereof from an acid aqueous solution, comprising:

contacting the aqueous solution with an organic solution containing a diamide of the formula:



$$R-(CH_3)N-\underset{\underset{O}{\|}}{C}-CH_2-\underset{\underset{O}{\|}}{C}-N(CH_3)-R \qquad (I)$$

in which R is an alkyl radical with 2 to 10 carbon atoms.

4,572,803

ORGANIC RARE-EARTH SALT PHOSPHOR

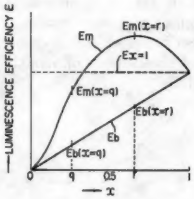
Katsuhiko Yamazoe, Yokohama; Akira Yoshino, Fujisawa; Yoshiharu Kitahama, Kawasaki, and Isamu Iwami, Zushi, all of Japan, assignors to Asahi Dow Limited, Tokyo, Japan

Division of Ser. No. 180,324, Aug. 22, 1980, Pat. No. 4,443,380. This application Jun. 30, 1982, Ser. No. 393,678

Claims priority, application Japan, Aug. 31, 1979, 54-110357; Jul. 8, 1980, 55-92214

Int. Cl.[4] C09K *11/46*

U.S. Cl. 534—16 **20 Claims**



1. An organic rare-earth salt phosphor comprising a crystalline rare-earth metal doped salt of an organic carboxylic acid represented by the general formula:

$$[A(COO)]_mZ$$

wherein:

[A(COO)] denotes a carboxylic acid radical derived from an α,β-unsaturated carboxylic acid selected from the group consisting of cinnamic acid and 3,5-dimethoxycinnamic acid,

Z denotes $(L_xM_y{}^{3+}M_{1-x-y}{}^{2+})$,

providing that

L is one rare-earth element selected from the group consisting of cerium, praseodymium, neodymium, samarium, europium, terbium, dysprosium, erbium, holmium, thulium and ytterbium,

M^{3+} is at least one trivalent metal element selected from the group consisting of yttrium, lanthanum, gadolinium and lutetium,

M^{2+} is at least one divalent metal element selected from the group consisting of calcium, strontium and barium, x is a value within the range of $0.04 \leqq x < 1$.

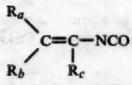
4,572,804

PREPARATION OF UNSATURATED ISOCYANATES

Michael J. Mullins, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Dec. 17, 1984, Ser. No. 682,528
Int. Cl.[4] C07C *118/00*
U.S. Cl. 260—453 P 20 Claims

18. A process for the preparation of unsaturated isocyanates comprising pyrolyzing an α,β-saturated geminal bis-carbamate to form an α,β-unsaturated monoisocyanate represented by the formula:



wherein R_a, R_b and R_c are independently H, aliphatic or aromatic moieties which can optionally contain halogen, N, O or S atoms.

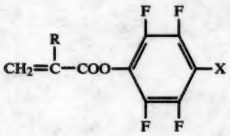
4,572,805

2,3,5,6-TETRAFLUOROPHENYL (METH) ACRYLATES AND METHOD FOR PRODUCTION THEREOF

Osamu Kaieda, Mishima; Koichi Hirota, Suita; Isao Okitaka, and Toshiaki Nakamura, both of Osaka, all of Japan, assignors to Nippon Shokubai Kagaku Kogyo Co., Ltd., Osaka, Japan

Filed Mar. 5, 1985, Ser. No. 708,289
Claims priority, application Japan, Mar. 27, 1984, 59-57354; Mar. 29, 1984, 59-59348
Int. Cl.[4] C07C *121/50*
U.S. Cl. 260—465 D 13 Claims

1. A compound represented by the general formula I:



(I)

wherein R denotes hydrogen atom or methyl group and X hydrogen atom or cyano group.

4,572,806

PROCESS FOR THE CONTINUOUS PRODUCTION OF TETRACHLOROPHTHALO-NITRILE IN TWO REACTORS IN SERIES

Giuseppe Ghielmetti, Milan; Liborio Casale, and Giordano Donelli, both of Brescia, all of Italy, assignors to Caffaro S.p.A., Milan, Italy

Filed Jul. 10, 1984, Ser. No. 629,948
Claims priority, application Italy, Jul. 19, 1983, 22129 A/83
Int. Cl.[4] C07C *121/56*
U.S. Cl. 260—465 G 7 Claims

1. Process for the production of tetrachlorophthalonitrile, comprising simultaneously introducing into an activated carbon fluidized bed reactor melted and atomized phthalonitrile, chlorine, hydrochloric acid and possibly nitrogen in sufficient quantity to vaporize the phthalonitrile and maintain the bed of activated carbon fluidized, and passing gas from said reactor through an activated carbon static bed reactor.

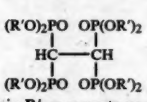
4,572,807

OLIGOPHOSPHONIC ACIDS, OLIGOPHOSPHINIC ACIDS, AND PROCESS OF PREPARATION

Gerhard Hägele, Hilden, Fed. Rep. of Germany, assignor to Henkel Kommanditgesellschaft auf Aktien, Düsseldorf-Holthausen, Fed. Rep. of Germany

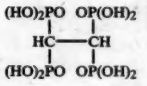
Filed Mar. 12, 1982, Ser. No. 357,489
Claims priority, application Fed. Rep. of Germany, Mar. 21, 1981, 3111152
Int. Cl.[4] C07F *9/30, 9/38*
U.S. Cl. 260—932 46 Claims

1. The compound of the formula



wherein R′ represents an alkyl with up to 25 carbon atoms, or water-soluble salt thereof.

2. The compound of the formula



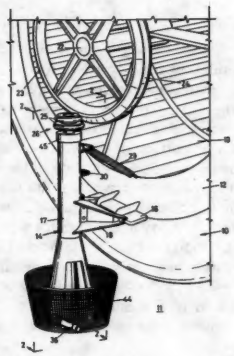
or a water-soluble salt thereof.

4,572,808

PUMP ARRANGEMENT

Frederic F. Seeley, 3 Rothesay Ave., St. Marys, Australia

Filed Jul. 9, 1984, Ser. No. 629,279
Claims priority, application Australia, Jul. 22, 1983, PG 0442
Int. Cl.[4] B01F *3/04*
U.S. Cl. 261—29 7 Claims



1. Improvements in an evaporative cooler which comprises a base tank, cabinet and fan housing assembly, a shaft within the fan housing carrying a fan impeller and journaled in bearings for rotation about a generally horizontal axis, drive means coupled for drive to the fan shaft, a pump within the cabinet having a pump stator and a pump spindle, and bearings in the pump stator which journal the pump spindle for rotation about a generally vertical axis, the pump having an inlet and an outlet, and water distribution means, the pump inlet opening into the base tank, and conduit means joining the pump outlet to the water distribution means,

said improvements comprising abutment means projecting from the pump stator and further abutment means projecting from the fan housing assembly, one of said abutment means terminating in a 'U'-shaped groove surface and the

other said abutment means terminating in a hinging edge which hingedly abuts the 'U'-shaped groove surface to form unattached pivotal mounting means coupling the pump to the assembly, a driving wheel on said fan shaft, a driven wheel on said pump spindle, and a releasable spring extending between said pump and assembly releasably retaining the driven wheel in driving engagement with the driving wheel and also releasably retaining said projecting edge in its abutment with said groove surface.

4,572,809

CARBURETTOR

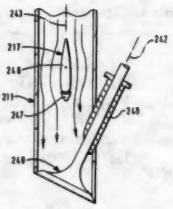
Peter W. Bothwell, "Meoncotet", 114 Shipston Rd., Stratford upon Avon, Warwickshire, United Kingdom

Filed Dec. 12, 1983, Ser. No. 560,195

Claims priority, application United Kingdom, Dec. 17, 1982, 8235974

Int. Cl.[4] F02M *17/12*

U.S. Cl. 261—44 A 2 Claims



1. In a carburettor having means defining an air inlet, a fuel inlet and an outlet for the mixture of fuel and air and having a movable valve member for regulating the flow of air from the air inlet to the outlet, the improvement wherein the valve member comprises relatively movable parts which collectively define an external surface of the valve member whereby the external shape of the valve member can be varied by relative movement of said parts and wherein the valve member comprises a main body, a flap mounted for limited movement relative to the main body and means for adjusting the angular relation of the flap to the main body in accordance with movement of the valve member as a whole relative to said means defining the outlet and wherein said main body defines an opening which is in communication with the fuel inlet for discharging fuel into the air stream which flows past the valve member in use.

2. The combination comprising a carburettor having means defining an air inlet, a fuel inlet and an outlet for a mixture of fuel and air, a main axis extending through the air inlet and through the outlet and having a valve member mounted for turning about a further axis transverse to the main axis for regulating the flow of air from the air inlet to the outlet, the valve member defining at least one opening which is in communication with the fuel inlet for discharging fuel into an airstream which flows past the valve member in use, a poppet valve for controlling flow of mixture from the carburettor through said outlet and means for guiding the poppet valve for reciprocation along a rectilinear path inclined to said main axis and defining a longitudinal centreline of said path, wherein the plane containing the main axis and said further axis is inclined at an acute angle to the plane containing the main axis and said centreline.

4,572,810

METHOD FOR PROVIDING URANIUM HYDROXIDE ON UO_2 PARTICLES PRIOR TO GENERATION OF FUGITIVE BINDER FOR SINTERING

Oliver H. LeBlanc, Jr., Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Sep. 17, 1984, Ser. No. 651,499

Int. Cl.[4] G21C *21/00*

U.S. Cl. 264—0.5 5 Claims

1. In the method of producing a sintered body of nuclear fuel material wherein at least one amine compound selected from the group consisting of amine carbonates and amine carbamates is added to particulate nuclear fuel material, the mixture is reacted in the presence of water, the resulting particulate nuclear fuel material is pressed to form a green pellet and, thereafter, the pellet is sintered, the improvement of preparing the mixture using particulate nuclear fuel having a predetermined amount of the hydroxide of the metallic element of the nuclear fuel in excess of about 2.0 wt% distributed over the surfaces of said particulate nuclear fuel.

4,572,811

METHOD FOR PRODUCING POLYESTER CONTAINERS

Akibo Ota, Funabashi, and Fumio Negishi, Katsushika, both of Japan, assignors to Yoshino Kogyosho Co., Ltd., Tokyo, Japan

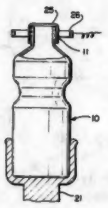
Continuation-in-part of Ser. No. 428,638, Sep. 30, 1982, abandoned, which is a continuation of Ser. No. 229,877, Jan. 30, 1981, Pat. No. 4,375,442, which is a continuation of Ser. No. 19,913, Mar. 12, 1979, abandoned. This application Jan. 11, 1984, Ser. No. 569,911

Claims priority, application Japan, Jun. 29, 1978, 53-89840[U]; Jul. 4, 1978, 53-81340; Oct. 9, 1978, 53-124303

The portion of the term of this patent subsequent to Mar. 1, 2000, has been disclaimed.

Int. Cl.[4] B29C *17/07*

U.S. Cl. 264—25 13 Claims



1. A method for producing a hollow bottle-shaped container of biaxially oriented polyethylene terephthalate having a non-biaxially oriented neck section, a bottom section, and a biaxially oriented body section extending between said neck section and bottom section from a preform having a prefinished neck section, said method comprising the steps of:

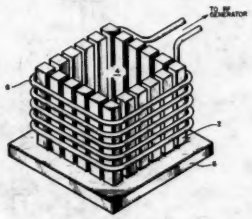
biaxially orienting in a mold only the regions of the preform below said neck section, including those immediately therebelow, to form the hollow bottle-shaped container,

heating only the prefinished neck section of said container to a heating temperature of at least the glass transition temperature of the polyethylene terephthalate for a heating time at least long enough to begin formation of crystal nuclei, and thereafter cooling the neck section to increase the density of the spherulite texture only in the neck section to produce a container having a crystallized area only in the neck section.

4,572,812
METHOD AND APPARATUS FOR CASTING CONDUCTIVE AND SEMICONDUCTIVE MATERIALS

Theodore F. Ciszek, Evergreen, Colo., assignor to The United States of America as represented by the Secretary of Energy, Washington, D.C.

Filed Aug. 13, 1984, Ser. No. 640,286
Int. Cl.[4] B29D *7/02*; B22D *27/02*
U.S. Cl. 264—25 20 Claims



1. An apparatus for use in a process for casting a conductive or semiconductive material, comprising:

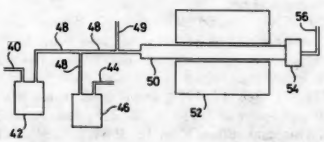
a plurality of conductive members arranged to be spaced from one another so as to define a container-like area for receiving and containing said material; and

means for inducing first electrical currents in each of said conductive members, which first electrical currents act collectively to induce a second electrical current in said material, which said second electrical current flows in a direction substantially opposite to the common direction of flow of said first electrical currents, so that said material is repelled away from and substantially prevented from contacting said conductive members during the casting of said material.

4,572,813
PROCESS FOR PREPARING FINE CARBON FIBERS IN A GASEOUS PHASE REACTION

Kohei Arakawa, Tokyo, Japan, assignor to Nikkiso Co., Ltd., Tokyo, Japan

Filed Aug. 8, 1984, Ser. No. 638,941
Claims priority, application Japan, Sep. 6, 1983, 58-162606; Mar. 1, 1984, 59-37246; Apr. 19, 1984, 59-77506
Int. Cl.[4] D01F *9/12*
U.S. Cl. 264—29.2 9 Claims



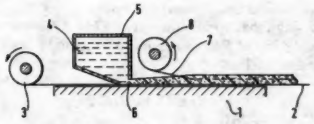
1. In a process for preparing fine carbon fibers in a gaseous phase reaction, the improvement consisting in that a gas mixture consisting of a gas of organic metal compound or compounds and a carrier gas is subjected to elevated temperatures, said organic metal compound at said elevated temperatures decomposing to form a metal catalyst which induces growth of carbon fibers in a floating state, and continuously recovering the carbon fibers.

2. A process for preparing fine carbon fibers in a gaseous phase reaction, characterized in that a gas mixture, consisting of a gas of organic metal compound or compounds, a gas of carbon compound and a carrier gas, is subjected to elevated temperatures, said organic metal compound decomposing when subjected to said elevated temperatures to form a catalyst which induces growth of carbon fibers in a floating state, and continuously recovering the carbon fibers.

4,572,814
MEDICAL-SURGICAL DRESSING AND A PROCESS FOR THE PRODUCTION THEREOF

Clifford Naylor, Dinas Powis, and David Pocknell, Rhoose, both of Wales, assignors to Dow Corning, Ltd., Barry Wales, Wales

Filed Jun. 30, 1983, Ser. No. 509,496
Claims priority, application United Kingdom, Jul. 6, 1982, 8219448
Int. Cl.[4] B29C *67/22*; A61F *13/00*
U.S. Cl. 264—46.4 4 Claims

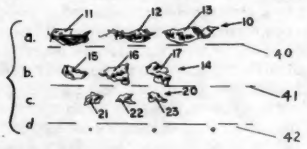


1. A process for the manufacture of a medical-surgical dressing having one open cellular surface and a substantially non cellular surface skin as its opposite surface, said process comprising applying a layer of a liquid foamable or foaming silicon elastomer composition to a substrate having a surface which is an absorbent for the liquid composition, embedding a sheet of reinforcing material in the layer of foamable or foaming composition, allowing the mixture to foam or continue foaming and to set to an at least partially cured silicon elastomer foam and thereafter separating the foam layer from the substrate to thereby form the open cellular surface at the surface formed by separation from the substrate.

4,572,815
PEANUT HULL THERMAL INSULATION

Walter L. Kaiser, 7520 Peach St., Erie, Pa. 16509

Filed Mar. 7, 1983, Ser. No. 473,002
Int. Cl.[4] C08J *11/00*
U.S. Cl. 264—115 1 Claim



1. A method of making insulation from peanut hulls consisting of screening and separating said hulls into sizes so that a maximum of said hulls are suitable for pneumatic application as insulation in walls of existing buildings and the remainder of said hulls suitable for use in insulation paneling comprising:

providing shelled peanut hulls,

grinding said hulls in a grinder to produce a minimum amount of fine parts and,

screening said ground hulls using a coarse screen of approximately 4 meshes per inch,

regrinding the hulls that are retained by the coarse screen,

screening said hulls that pass through said coarse screen with a medium screen of about 8 meshes per inch,

using said hulls that are retained by said medium screen, which consist of about fifty percent (50%) of said hulls ground up, for blown insulation in walls of buildings,

screening said hulls that pass through said medium screen with a fine screen at about 16 mesh per inch,

adding a binding material to said hulls that pass through said fine screen and forming said hulls that pass through said medium screen but are retained by said fine screen into a first type of panel,

curing said panel,

adding a binder material to said particles that pass through said fine screen,

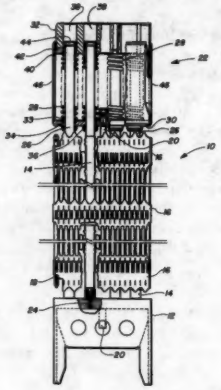
forming said material that passes through said fine screen into a second grade of panel and curing said binder in said second grade of panel.

4,572,816

RECONSTITUTING A NUCLEAR REACTOR FUEL ASSEMBLY

Robert K. Gjertsen, Monroeville; John F. Wilson, Murrysville, and John M. Shallenberger, O'Hara Township, Allegheny County, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Dec. 21, 1983, Ser. No. 564,056
Int. Cl.[4] G21C *19/33*
U.S. Cl. 376—261 12 Claims



1. A method of reconstituting a nuclear reactor fuel assembly having a top nozzle subassembly attached to the upper end portion of its control rod guide thimble in which the subassembly includes a lower adapter plate and an upper hold-down plate disposed on the thimble's end portion, and a spring coiled about the thimble and interposed between said plates for mounting the top nozzle subassembly in an operation mode, the method of reconstituting comprising the steps of:

(a) applying a force on the upper hold-down plate to move it downwardly to compress the spring to transform said subassembly from its operation mode to a reconstitution mode;

(b) severing the wall of the thimble below a first attaching retainer mounted on the end of said thimble which defines the limit of the upward movement of said hold-down plate during said operation mode;

(c) removing said top nozzle subassembly from the upper end portion of said thimble for the removal and replacement of fuel rods contained within the fuel assembly;

(d) replacing the top nozzle subassembly in its reconstitution mode on the upper end portion of the severed thimble;

(e) mounting a second attaching retainer on the upper end portion of said severed thimble for redefining the upward limit movement of said hold-down plate during said operation mode; and

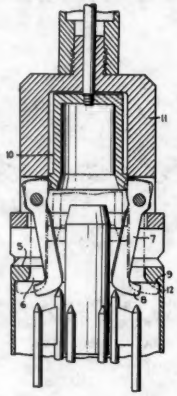
(f) releasing the force on said hold-down plate to transform said top nozzle subassembly from its reconstitution mode to its operation mode.

4,572,817

PLUMB NOZZLE FOR NUCLEAR FUEL ASSEMBLY

Bernard L. Silverblatt, Mt. Lebanon, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Sep. 30, 1983, Ser. No. 538,041
Int. Cl.[4] G21C *3/30*
U.S. Cl. 376—409 6 Claims



1. An elongated nuclear reactor fuel assembly having an asymmetric weight distribution across a cross section thereof, including a nozzle affixed to one end of the fuel assembly having a plurality of lifting surfaces formed thereon on which the fuel assembly can be supported when suspended from said surfaces, at least one of said lifting surfaces being located at a first elevation relative to the longitudinal axis of the fuel assembly, and a second of said lifting surfaces being located at a second elevation different from said first elevation wherein the difference in said first and second elevations is sized to offset said asymmetric weight distribution when the fuel assembly is supported from said first and second surface so that when so supported the fuel assembly will hang plumb.

4,572,818

PROCESS FOR PURIFYING METAL COMPOSITIONS

Merton C. Flemings, Cambridge, Mass., and Andrew L. Lux, Creve, Mo., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Continuation of Ser. No. 507,903, Jun. 27, 1983, abandoned, which is a continuation of Ser. No. 247,500, Mar. 25, 1981, abandoned, which is a continuation-in-part of Ser. No. 884,457, Mar. 8, 1978, abandoned, which is a continuation-in-part of Ser. No. 876,591, Feb. 10, 1978, abandoned, which is a continuation-in-part of Ser. No. 760,875, Jan. 21, 1977, abandoned. This application Mar. 16, 1984, Ser. No. 590,407
Int. Cl.[4] C22C *1/00, 33/00*
U.S. Cl. 420—590 7 Claims

1. A process for removing at least a portion of secondary phase material from a metal alloy comprising the steps of

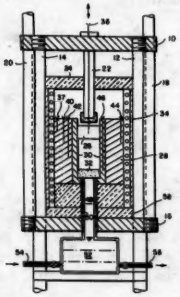
heating a metal alloy to a temperature not substantially less than its nonequilbrium solidus temperature to form a first liquid-solid composition;

applying a superatmospheric pressure to said liquid-solid composition sufficient to overcome the inherent strength of the solid and sufficient to cause the first liquid in said composition to flow;

separating the pressurized flow liquid from the pressurized solid remaining in said composition;

increasing the temperature to partially melt the secondary phase between dendritic arms to form a solid phase and a second liquid phase;

maintaining or increasing said pressure and said increased temperature on said remaining solid after said first liquid has been separated from said composition, thereby to separate said second liquid phase from said solid; and



cooling said remaining solid as a substantially homogenous composition.

4,572,819

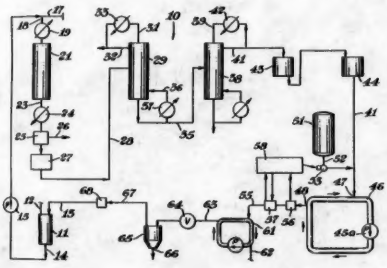
APPARATUS FOR ANIONIC POLYMERIZATION WHEREIN THE MOLECULAR WEIGHT OF THE POLYMER IS CLOSELY CONTROLLED

Duane B. Priddy, and Michael Pirc, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 525,863, Aug. 24, 1983. This application Jul. 24, 1984, Ser. No. 633,834

Int. Cl.[4] G01N *21/75*; C08F *2/06*

U.S. Cl. 422—62 **2 Claims**



1. An apparatus for the preparation of anionically polymerized polymers, the apparatus comprising in cooperative combination a monomer supply means, a monomer flow control means associated with a discharge of the monomer supply means, an anionic polymerization initiator supply means, an initiator flow control means in association with a discharge of the initiator supply means, a continuously stirred tank reactor having an inlet and an outlet, the inlet of the continuously stirred tank reactor being in operative communication with the monomer flow control means and the initiator flow control means and adapted to receive material therefrom; a conduit connected to the discharge of the continuously stirred tank reactor, the conduit being in operative communication with an optical means in combination with a control means, the optical means providing a first signal which varies as molecular weight of polymer in effluent from the continuously stirred tank reactor varies, the first signal passing to the control means which is connected to the initiator flow control means so as to adjust the initiator flow control means to thereby provide molecular weight control of a polymer being prepared, a gel permeation chromatograph positioned and arranged with respect to the conduit and the control means so as to receive effluent from the continuously stirred reactor and measure the molecular weight of a polymer and provide a second signal indicative of the molecular weight of the polymer to the control means to adjust the optical means to provide a desired first signal to thereby provide a polymer of a generally uniform molecular weight.

4,572,820

PROCESS AND APPARATUS FOR THE PRODUCTION OF A FLOWABLE REACTION MIXTURE

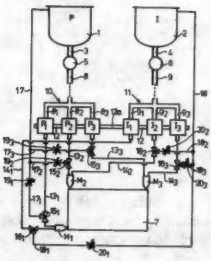
Heinrich Boden, Leverkusen, and Walter Schneider, Overath, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Sep. 14, 1984, Ser. No. 650,486

Claims priority, application Fed. Rep. of Germany, Oct. 1, 1983, 3335785

Int. Cl.[4] G05D *11/02*

U.S. Cl. 422—133 **9 Claims**



1. A process for the production of a flowable reaction mixture from at least two flowable reaction components which comprises conveying said components from storage zones as main flows, metered in a predetermined ratio, to several mixing zones which are connected in parallel, said process further characterized in that the main flows are divided up in each case into a number of divisional flows corresponding to at least the number of mixing zones, which divisional flows are combined with each other in pairs, and the metering ratio of the divisional flows corresponds to the metering ratio of the main flows.

6. An apparatus for the production of flowable reaction mixtures from at least two flowable reaction components comprising storage containers from which supply lines lead via metering pumps to at least three mix heads which are positioned in parallel, further characterized in that one metering pump is provided for each reaction component, and flow dividers consisting of parallel-positioned elements are provided between these metering pumps and the mix heads in the supply lines.

4,572,821

APPARATUS FOR DISSOLVING OZONE IN A FLUID

Eric Brodard, Rueil Malmaison; Jean-Pierre Duguet, Le Pecq; Joël Mallevialle, Carrieres sur Seine, and Michel Roustan, Ramonville, all of France, assignors to Societe Lyonnaise des Eaux et de l'Eclairage, Paris, France

Filed May 7, 1984, Ser. No. 609,552

Claims priority, application France, May 10, 1983, 83 07764

Int. Cl.[4] C02F *1/78, 1/50*

U.S. Cl. 422—186.12 **14 Claims**

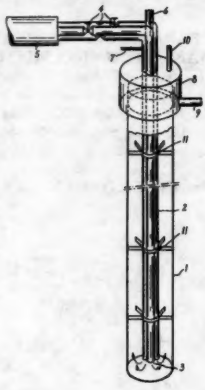
1. An apparatus for the dissolution of ozone in a fluid for the ozonization thereof, said apparatus comprising:

a vertically extending closed tubular chamber having a vertical height of from 10 to 100 m and a diameter of from 0.5 to 5 m;

at least one tube extending vertically into said chamber and

having a lower end opening into said chamber, said at least one tube extending throughout substantially the entire height of said chamber and having a diameter of less than 50 cm;

means for introducing fluid to be treated and means for introducing ozonized gas into an upper end of said tube, whereby said fluid and said gas pass downwardly through



said tube, are discharged from said lower end of said tube into a lower end of said chamber, and then pass upwardly through said chamber, whereby ozone dissolves in said fluid;

means for discharging from an upper end of said chamber said fluid having dissolved therein said ozone; and

means for discharging excess gas from said upper end of said chamber.

4,572,822

METHOD OF RECOVERING METALS FROM INDUSTRIAL BY-PRODUCTS

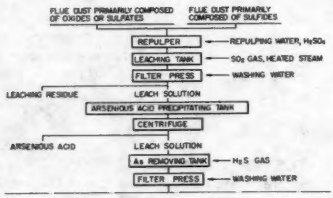
Hideki Abe, Yachiyo, and Hiroshi Tanaka, Musashino, both of Japan, assignors to Dowa Mining Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 426,205, Sep. 28, 1982, abandoned. This application Mar. 8, 1984, Ser. No. 587,387

Claims priority, application Japan, Feb. 15, 1982, 57-22482

Int. Cl.[4] C01G *3/12, 28/00*

U.S. Cl. 423—37 **19 Claims**



1. A method of recovering valuable metals from an industrial by-product that contains copper and arsenic, and at least one metal selected from the group consisting of lead, zinc, iron, silver and cadmium, at least part of said copper being present as acid-soluble copper in the form of at least one of oxides and sulfate, said method comprising the steps of:

(1) leaching the by-product with sulfuric acid in an SO_2 gas atmosphere at a temperature of at least 70° C. in the presence of a solid sulfide or sulfur in an amount sufficient to precipitate all dissolved copper so as to maintain the solution substantially free of copper ions and to thereby selectively precipitate substantially all copper contained in said by-product as copper sulfide in the form of a copper-containing precipitate and to form a filtrate containing substantially no copper and having dissolved therein at least one metal selected from the group consisting of arsenic, zinc, iron and cadmium;

(2) separating the copper-containing precipitate by filtration from the filtrate under conditions which do not cause the arsenic present in the filtrate to crystallize as arsenious acid;

(3) cooling or concentrating the resulting filtrate to thereby precipitate crystals of arsenious acid; and

(4) separating the precipitated arsenious acid crystals from the filtrate.

4,572,823

PROCESS FOR RHENIUM RECOVERY

Takashi Ogata; Hiroshi Tasaki, and Shunichi Kasai, all of Toda, Japan, assignors to Nihon Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 7, 1984, Ser. No. 607,835

Claims priority, application Japan, May 13, 1983, 58-82576

Int. Cl.[4] C01G *47/00*

U.S. Cl. 423—49 **2 Claims**

1. A process for rhenium recovery by the use of an anion exchange resin, characterized in that rhenium is eluted from the rhenium-adsorbed anion exchange resin with a hydrochloric acid solution containing a metal chloride selected from the group consisting of cadmium chloride and zinc chloride.

4,572,824

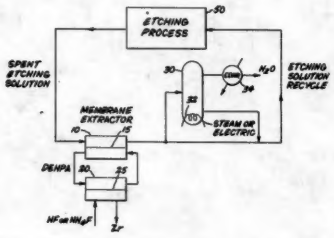
PROCESS FOR RECOVERY OF ZIRCONIUM AND ACID FROM SPENT ETCHING SOLUTIONS

Bang M. Kim, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Nov. 1, 1984, Ser. No. 667,027

Int. Cl.[4] C01G *25/00*

U.S. Cl. 423—70 **8 Claims**



1. A method for treating spent aqueous etchant containing zirconium, nitric acid, and hydrofluoric acid from a zirconium tube etching bath, said method comprising:

contacting said zirconium bearing etchant solution with a first side of a first membrane disposed in a first chamber to produce zirconium depleted etchant;

contacting the second side of said first membrane with a zirconium selective solvent;

circulating said solvent which has been in contact with said second side of said first membrane in said first chamber so as to contact a first side of a second membrane disposed in a second chamber;

recirculating the solvent which has been in contact with the first side of said second membrane so as to recontact the second side of said first membrane

contacting the second side of said second membrane with a stripping solution; and

removing water from said zirconium depleted etchant whereby the concentration of said acids is increased.

4,572,825

PROCESS FOR BLEACHING NATURAL CHALK

Werner Sebb, Geretsried, and Heinrich Dammann, Söhlde, both of Fed. Rep. of Germany, assignors to Peroxide-Chemie GmbH, Höllriegelskreuth, Fed. Rep. of Germany

Filed May 25, 1982, Ser. No. 381,990

Claims priority, application Fed. Rep. of Germany, Jun. 4, 1981, 3122218

Int. Cl.[4] G01F *11/18*

U.S. Cl. 423—173 7 Claims

1. A process for bleaching natural chalk by treatment with hydrogen peroxide in an aqueous medium, comprising the steps of

(a) preparing an aqueous suspension of 50 to 80% by weight fine grained natural chalk and 50 to 20% by weight water and containing 0.1 to 1.5% by weight, based on the dry weight of the chalk, of a dispersant and optionally containing a hydrogen peroxide stabilizer or activator or a salt of hydrogen peroxide with a divalent metal,

(b) wet grinding the suspension to reduce the particle size until about 9/10 of the particles have a grain size of $<4\mu$ (corresponding to a surface area of 3–10 m^2/g),

(c) mixing the suspension with hydrogen peroxide or a salt of hydrogen peroxide with a divalent metal at temperatures between 50° and 99° C. and at an alkaline pH and stirring intensively until it is mixed and foaming commences,

(d) allowing the suspension to stand until foam formation is complete, and then

(e) separating the foam formed with the dark particles contained therein.

4,572,826

TWO STAGE PROCESS FOR HCN REMOVAL FROM GASEOUS STREAMS

George R. Moore, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Dec. 24, 1984, Ser. No. 685,708

Int. Cl.[4] C01C *3/00*

U.S. Cl. 423—236 8 Claims

1. A process for removing HCN from a gaseous stream comprising

(a) contacting said stream with a compound having the formula

wherein R_1 and R_2 are hydrogen or alkyl containing 1 through 3 carbon atoms, provided that R_1 and R_2 are never simultaneously alkyl; precursors of said compounds; and mixtures of said compounds, precursors, and compounds and precursors, in an amount sufficient to remove at least the bulk of the HCN, under conditions to convert HCN, and producing a partially-purified gas stream having reduced HCN content;

(b) contacting said partially-purified gas stream with an effective amount of an aqueous solution containing a reactant selected from ammonium polysulfide, sodium polysulfide, and a mixture of ammonium polysulfide and sodium polysulfide, under conditions to convert HCN, producing a purified gas stream with a further reduced HCN content.

4,572,827

PROCESS FOR PREPARING FINELY-DIVIDED SILICON DIOXIDE IN GOOD YIELD

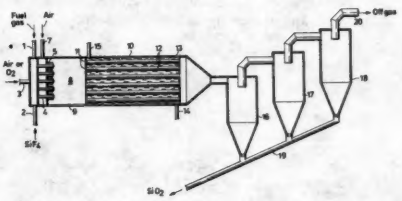
Gosta Flemmert, Agaresgatan 38, 269 00 Bastad, Sweden

Continuation of Ser. No. 328,287, Dec. 7, 1981, abandoned. This application Oct. 18, 1984, Ser. No. 594,150

Claims priority, application Sweden, Dec. 12, 1980, 8008769

Int. Cl.[4] C01B *33/182*

U.S. Cl. 423—336 7 Claims



1. A process for preparing finely-divided silicon dioxide in good yield which comprises reacting a silicon fluoride in the vapor phase with water vapor, combustible gas and free oxygen-containing gas in a flame reaction zone to form hydrogen fluoride and silicon dioxide entrained in a gaseous reaction mixture; withdrawing the gaseous reaction mixture from the flame reaction zone; and then immediately and rapidly cooling the gaseous reaction mixture and entrained silicon dioxide to a temperature below 700° C. by passing the gaseous reaction mixture in turbulent flow at a Reynolds number above 300 under constraint through a plurality of passages all of which consist of straight passages in alignment with the gas flow, the passages having a diameter within the range from about 20 to about 150 mm and smooth walls constituting cooling surfaces.

4,572,828

METHOD FOR PRODUCING SILICON NITRIDE SINTERED BODY OF COMPLEX SHAPE

Nobuhiro Sato; Yuji Katsura, and Haruyuki Ueno, all of Kitakyushu, Japan, assignors to Kurosaki Refractories Co., Ltd., Kitakyushu, Japan

Filed Feb. 14, 1985, Ser. No. 701,425

Claims priority, application Japan, Feb. 16, 1984, 59-28145

Int. Cl.[4] C01B *21/063;* C04B *35/58, 37/00*

U.S. Cl. 423—344 2 Claims

1. A method for producing a silicon nitride sintered body of a complex shape which comprises interposing a bonding agent composed of silicon powder and resin on bonding faces of each separate molded body composed of silicon powder and solvent-insoluble cured resin, integrating said molded bodies at their bonding faces by heat-curing the resin in said bonding agent, heating the integrated body of the molded bodies thus bonded together at 500° to 1200° C. in a non-oxidizing gas atmosphere so that the resin is pyrolyzed and the silicon particles form a sintered body, and nitriding said integrated silicon body by heating at 1200° to 1500° C. in a nitriding atmosphere, the resin being one which performs reduction action when thermally decomposed and has a great shrinkage.

4,572,829

AMMONIA SYNTHESIS GAS PURIFICATION

Andrija Fuderer, Antwerpen, Belgium, assignor to Union Carbide Corporation, Danbury, Conn.

Filed Nov. 9, 1984, Ser. No. 669,864

Int. Cl.[4] C01C *1/04*

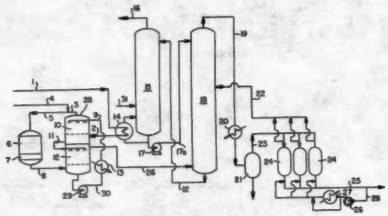
U.S. Cl. 423—359 6 Claims

1. In the purification of a reformed gas mixture following water gas shift conversion to produce a purified ammonia synthesis gas stream, the improved processing sequence consisting essentially of:

(a) selectively catalytically oxidizing the residual carbon monoxide content of said gas mixture to carbon dioxide so as to reduce the carbon monoxide content of said gas mixture to less than about 20 ppm, said selective catalytic oxidation being carried out with an excess of air, with said excess oxygen being catalytically reacted with a small amount of hydrogen so that the residual oxygen level is reduced to less than about 3 ppm;

(b) removing the bulk of the carbon dioxide content of said gas mixture by liquid absorption;

(c) removing residual amounts of carbon monoxide, carbon dioxide and water by selective adsorption on the fixed



beds of a thermal swing adsorption system, a dry, purified ammonia synthesis gas stream containing less than a total of 10 ppm of carbon monoxide and carbon dioxide being recovered from said thermal swing adsorption system;

(d) passing the resulting dry, purified ammonia synthesis gas stream having a low content of methane to an ammonia production operation without intermediate passage of said ammonia synthesis gas stream to a methanation unit or to a cryogenic unit for removal of carbon monoxide and carbon dioxide therefrom;

whereby the efficiency of the overall purification operation and the effective utilization of hydrogen are enhanced.

4,572,830

PROCESS FOR DETERMINING AND CONTROLLING THE COMPOSITION OF AQUEOUS SOLUTIONS OF NH_3 AND CO_2

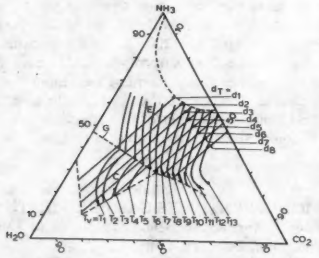
Andreas J. Biermans, Urmond, and Henk C. Burks, Oirsbeek, both of Netherlands, assignors to Unie van Kunstmestfabrieken B.V., Utrecht, Netherlands

Filed Dec. 23, 1983, Ser. No. 564,884

Claims priority, application Netherlands, Dec. 24, 1982, 8204979

Int. Cl.[4] F27B *15/08*

U.S. Cl. 423—659 **4 Claims**



1. A process for controlling the composition of an aqueous solution of NH_3 and CO_2 from which ammonium carbamate or ammonium carbonate.H_2O crystallizes out upon cooling to below the saturation temperature, wherein said aqueous solution has an ammonia content of less than about 60% by weight, a weight ratio of ammonia to carbon dioxide in the range of between about 0.75 and 7, and a water content by weight of less than about the sum of 65% plus 0.75 times the weight percent of carbon dioxide, and process comprising the steps of:

measuring the density and the saturation temperature of said aqueous solution, and correcting said measuring density to a selected standard temperature;

comparing said mesured corrected density and saturation temperature against a data base derived from predetermined density data at said standard temperature, and from predetermined saturation temperature data for reference aqueous ammonia and carbon dioxide containing solutions having known compositions;

determining a value corresponding to the known composition of the reference aqueous ammonia and carbon dioxide containing solution having a density and saturation temperature correlating to the correct measured density and saturation temperature of said aqueous solution; and

adding water to said aqueous solution in an amount adjusted in response to said determined value.

4,572,831

SKIN-MARKING COMPOSITIONS AND DEVICES, AND THEIR USE

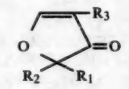
Gerald M. Rosen, 403 Knob Ct., Chapel Hill, N.C. 27514

Filed Oct. 19, 1982, Ser. No. 435,152

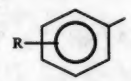
Int. Cl.[4] A61K *49/00*; G01N *31/00, 31/22*

U.S. Cl. 424—7.1 **4 Claims**

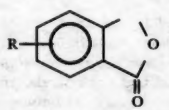
1. In a diagnostic or therapeutic procedure repeatedly involving a same area of the skin, which occurs at intervals of from 1 to about 21 days and wherein an area of the skin of a patient is marked to delineate the area of the skin involved in the procedure, the improvement comprising marking the skin with a fluorogenically-effective amount, in a carrier liquid, of a furanone of the formula



wherein R^1 is lower alkoxy or phenyl lower alkoxy and R_2 is



or, R_1 and R_2 collectively are



wherein R in each instance is hydrogen or one or more of halogen, lower alkyl, trifluoromethyl, lower alkoxy, nitrol, cyano, carboxy or carboxy lower alkyl, and R_3 is lower alkyl, phenyl lower alkyl or aryl, thereby rendering the marked area visible under ultraviolet light after about 15–30 minutes and thereafter identifying the marked area by examination of the skin under ultraviolet light, whereby the patient may wash the marked area and avoid the embarrassment of visibly marked skin during the time period between procedures.

4,572,832

SOFT BUCCAL

Kazuo Kigasawa; Hiroaki Shimizu, both of Tokyo; Toshihiro Hayashi, Chiba; Kazuo Watabe, Kanagawa; Akira Tanizaki, Tokyo; Osamu Koyama, Tokyo; Kikuo Wakisaka, Tokyo, and Yasuaki Ogawa, Osaka, all of Japan, assignors to Grelan Pharmaceutical Co., Ltd., Tokyo, Japan

Filed Oct. 7, 1983, Ser. No. 540,161

Claims priority, application Japan, Oct. 7, 1982, 57-175352; Sep. 20, 1983, 58-172245

Int. Cl.[4] A61K *9/20, 9/22, 47/00*

U.S. Cl. 424—19 **13 Claims**

1. A soft buccal suitable for retention in the cavity of the mouth particularly suitable for prolonged residence in said cavity due to the softness thereof, said soft buccal containing

(1) a pharmaceutically effective amount of a medicament to be absorbed through the oral mucosa and to be delivered over the desired residence period of said soft buccal in said cavity;

(2) a water-soluble protein in an amount of from 0.5 to 150 parts by weight per part of drug (1);

(3) 0.01 to 3 parts by weight of a polyhydric alcohol per part of protein (2); and

(4) 0.01 to 10 parts by weight of fatty acid ester or a carboxyvinyl polymer, per part of protein (2).

4,572,833

METHOD FOR PREPARING A PHARMACEUTICAL CONTROLLED RELEASE COMPOSITION

Arne M. Pedersen, Vanlose, and Jens R. Jensen, Stenlose, both of Denmark, assignors to A/S Alfred Benzon, Copenhagen, Denmark

Filed Aug. 15, 1983, Ser. No. 523,636

Claims priority, application Denmark, Aug. 13, 1982, 3653/82

Int. Cl.[4] A61K *9/22, 9/48, 9/50, 9/54*

U.S. Cl. 424—20 **20 Claims**

1. A method for preparing a pharmaceutical oral controlled release composition in which individual units comprise coated units of an active substance which is subject to controlled release as a result of coating the units with a substantially water-insoluble, but water-diffusable controlled release coating, comprising applying, on units comprising the active substance, a film-coating mixture comprising a solvent, a film-forming substance dissolved in the solvent, and a hydrophobic substance substantially microdispersed in the film-coating mixture in a molten, but undissolved state, the film-coating mixture being applied at a temperature above the melting point of the hydrophobic substance.

4,572,834

BIOLOGIC AND METHOD OF PREPARING SAME

Robert L. Stout, Overland Park, Kans., assignor to Clinical Reference Laboratory, Inc., Lenexa, Kans.

Filed Apr. 10, 1984, Ser. No. 598,744

Int. Cl.[4] A61K *35/14, 39/00*

U.S. Cl. 424—86 **4 Claims**

1. A method of producing a glycosylated immunomodulating and serum cholesterol and triglyceride level decreasing protein biologic having an apparent molecular weight of above about 100,000, comprising the steps of:

injecting a feline panleukopenia or canine origin parvovirus into an animal other than a feline or canine, and which is a non-permissive host for the virus;

permitting said injected animal to react to the presence of said virus for a period of time of at least one month for developing in the animal's blood serum said biologic such that 50 microliters of the animal's serum, when added to an in vitro human white blood cell culture containing $2\text{–}4\times10^5$ white blood cells and followed by three days incubation at 37° C. under a 5% CO_2/95% air atmosphere, will give rise to at least about a 50% increase in T-Helper and Natural Killer cells in the biologic-supplemented cell culture as compared with an otherwise identical and identically cultured in vitro cell culture having added thereto 50 microliters of serum from a normal animal of the same species as said injected animal, such rise in T-Helper and Natural Killer cells being detected by staining with fluorescent-labelled monoclonal antibodies against T-Helper and Natural Killer cells; and

recovering blood from said injected animal containing said biologic, and fractionating the recovered blood to separate potentially interfering substances from the biologic.

4,572,835

METHOD FOR MANUFACTURING DEAERATED CHOCOLATE PRODUCTS

Iwao Hachiya, and Norio Joyama, both of Kanagawa, Japan, assignors to Meiji Seika Kaisha Ltd., Tokyo, Japan

Filed Jun. 21, 1984, Ser. No. 622,825

Claims priority, application Japan, Jun. 23, 1983, 58-111877

Int. Cl.[4] A23G *1/00*

U.S. Cl. 426—306 **13 Claims**

1. A method for manufacturing a deaerated fatty confectionary consisting essentially of the steps of: holding a fatty confectionary mass in a fluidal state at a reduced pressure lower than atmospheric pressure and stirring with a scraping rotary blade to subject said mass to a deaerating treatment of removing air from said mass, and manufacturing confectionary products with the deaerated mass wherein said fatty confectionary mass has a viscosity of less than about 90,000 cps, and said reduced pressure is in a range of 10 to 350 torr, and said reduced pressure is inversely proportional to said viscosity, and wherein said fatty confectionary mass is subjected to said deaerating treatment until a quantity of air therein is less than 0.7% by volume, and said fatty confectionary mass is in a form of a thin film during said deaerating treatment and at said reduced pressure.

4,572,836

STABILIZED EDIBLE HERB COMPOSITION AND METHOD

Abraham I. Bakal, Parsippany, N.J., assignor to Gourmeta, Inc., Winnetka, Ill.

Filed Nov. 28, 1984, Ser. No. 675,951

Int. Cl.[4] A23L *1/221*

U.S. Cl. 426—321 **11 Claims**

1. A stabilized pasteurized edible herb composition consisting essentially of one or more edible herbs in particulate form having an average particle size of less than about 600 microns, in an amount within the range of from about 30 to about 70% by weight, said herb selected from the group consisting of garlic, chives, basil, parsley, oregano, rosemary, sage, lovage, dill-weed, tarragon, marjoram, thyme, mint, chervil, coriander, sorrel, savory, onions or mixtures thereof, an edible salt selected from the group consisting of sodium chloride, potassium chloride or mixtures thereof to reduce enzymatic activity of the herbs and impart stability and flavor preservation, in an amount within the range of from about 2 to about 5% by weight, an edible acid selected from the group consisting of citric acid, malic acid, tartaric acid, hydrochloric acid, phosphoric acid or mixtures thereof in an amount within the range of from about 0.1 to about 0.7% by weight to reduce the pH of the herb composition to below 4.5, and an edible oil as a lubricant to impart a paste-like consistency in an amount within the range of from about 25 to about 70% by weight, all of the above % being based on the weight of the herb composition.

8. A method for forming the stabilized edible herb composition as defined in claim 1, which comprises reducing the average particle size of said herb to less than about 600 microns, adding salt and acid to the particulate herb to form a herb mixture, adding said edible oil thereto, and pasteurizing said herb mixture by maintaining said herb mixture at a temperature of at least about 80° C. for a period of from about 10 to about 0.2 minutes to sterilize the composition.

4,572,837

PROTEIN PRODUCT

Stephen Poole; Stuart I. West, and Clifford L. Walters, all of Leatherhead, England, assignors to The British Food Manufacturing Industries Research Association, Leatherhead, England

Filed Jun. 28, 1984, Ser. No. 625,646
Int. Cl.[4] A23J *3/00*; A23L *1/04, 1/24*; A23G *3/00*
U.S. Cl. 426—564 14 Claims

1. An edible aqueous dispersion capable of forming a foam, a gel or an emulsion comprising at least one non-aqueous phase selected from the group consisting of air, an edible lipid and an edible protein matrix, and an aqueous phase, wherein the aqueous dispersion contains at least one edible globular acidic protein having an isoelectric point of less than 7 and at least one edible basic protein, wherein the basic protein has an isoelectric point of at least 9.5 and a molecular weight of at least 4,500, and wherein the ratio of the concentration of the acidic protein to the concentration of the basic protein is from about 25:1 to 5:1.

4,572,838

METHOD OF RETARDING DENATURATION OF MEAT PRODUCTS

Tyre C. Lanier, New Hill, N.C., and Takayuki Akahane, Tokyo, Japan, assignors to North Carolina State University, Raleigh, N.C.

Filed Nov. 27, 1984, Ser. No. 675,145
Int. Cl.[4] A23B *4/14*; A23L *1/31*
U.S. Cl. 426—643 15 Claims

1. A method of retarding denaturation of muscle protein in meat products during extended storage without materially increasing the caloric content or substantially changing the flavor of the meat product, said method comprising the steps of:

(a) comminuting a meat product containing muscle protein, and

(b) admixing the comminuted meat product with an antidenaturant in an amount sufficient to retard denaturation of the muscle protein in the meat product, said antidenaturant consisting essentially of polydextrose whereby denaturation is retarded without substantially increasing the caloric content or substantially changing the flavor of the meat product.

4,572,839

PROCESS FOR THE RAPID STERILIZATION OF PARTIALLY HYDROLYZED ANIMAL OFFAL

Jean-Louis Guitteny, Jargeau; Roger Pernod, Bouzy la Forêt; Christian Roques, St. Jean de Braye, and Guy Tran Van, Clery Saint André, all of France, assignors to Unisabi, S.A., Paris, France

Continuation of Ser. No. 403,933, Aug. 2, 1982, abandoned. This application Apr. 25, 1985, Ser. No. 726,941
Claims priority, application France, Aug. 7, 1981, 81 15392
Int. Cl.[4] A23L *1/312*
U.S. Cl. 426—646 8 Claims

1. A method for rapidly sterilizing a protein hydrolysis product of animal offal to give a product for use as a foodstuff, which method comprises:

(a) grinding animal offal to bring it into the state of a viscous slurry of particles of animal protein having a mean particle size from about 0.1 millimeter to 20 millimeters,

(b) partially hydrolyzing said slurry by the addition of acid thereto to convert animal protein therein to lower molecular weight constituents, and

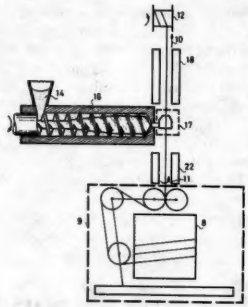
(c) then heating a thin layer of said hydrolyzed slurry at a temperature from about 120° C. to about 150° C. for a time between about 3 seconds and about 15 minutes to sterilize said slurry without coagulation of residual protein therein.

4,572,840

METHOD OF MANUFACTURING AN OPTICAL FIBER WITH CHIRALIC STRUCTURE AND A DEVICE FOR PUTTING THIS METHOD INTO PRACTICE

Jean Gombert, Paris; Serge Blaison, Orsay; Christian Quinty, La Ville du Bois, and Maryse Gazard, Puteaux, all of France, assignors to Thomson-CSF, Paris, France

Filed Jan. 30, 1985, Ser. No. 696,492
Claims priority, application France, Feb. 2, 1984, 84 01600
Int. Cl.[4] C03C *25/02*; B05C *11/00*; B05D *5/06, 3/06*
U.S. Cl. 427—36 17 Claims



1. A method for manufacturing an optical fiber with a chiralic structure which uses an optical fiber coated with a primary coating, comprising:

twisting this fiber about its axis of symmetry at a temperature less than the vitreous transition temperature of this fiber;

coating with a polymer in the viscous state so as to form an envelope about this fiber;

and curing this polymer while increasing its YOUNG's modulus until a modulus is obtained in the range: 1 Giga Pascal, 100 Giga Pascal.

7. A device for manufacturing an optical fiber with a chiralic structure, comprising a feed drum on which is wound an optical fiber coated with a primary coating and means for winding this fiber on a take up drum while causing it to advance and twisting it about its axis of symmetry, means for coating this fiber once twisted with a polymer so as to form an envelope about this fiber and means for curing said envelope being disposed between said feed drum and said take up drum.

4,572,841

LOW TEMPERATURE METHOD OF DEPOSITION SILICON DIOXIDE

Grzegorz Kaganowicz, Belle Mead, N.J., and John W. Robinson, Levittown, Pa., assignors to RCA Corporation, Princeton, N.J.

Filed Dec. 28, 1984, Ser. No. 687,365
Int. Cl.[4] B05D *3/06*
U.S. Cl. 427—39 9 Claims

1. In a process for depositing a dense silicon dioxide film onto a substrate in a glow discharge apparatus comprising the steps of

placing the substrate into the deposition chamber of said apparatus;

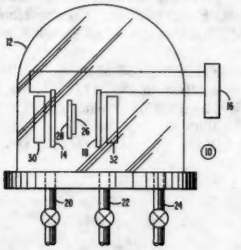
evacuating said chamber;

introducing a source of silicon and an oxygen containing gaseous precursor into said chamber;

applying sufficient power to generate a plasma and thereby deposit silicon dioxide onto said substrate;

the improvement comprising introducing hydrogen into said chamber in an amount such that at least 4 atoms of hydro-

gen are introduced for every atom of silicon introduced by the silicon-containing precursor and further wherein said amount of hydrogen is independent of any hydrogen introduced by said silicon-containing precursor.



4,572,842

METHOD AND APPARATUS FOR REACTIVE VAPOR DEPOSITION OF COMPOUNDS OF METAL AND SEMI-CONDUCTORS

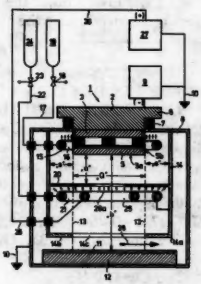
Anton Dietrich, Rodenbach; Klaus Hartig, Ronneburg, and Michael Scherer, Rodenbach, all of Fed. Rep. of Germany, assignors to Leybold-Heraeus GmbH, Cologne, Fed. Rep. of Germany

Filed Aug. 24, 1984, Ser. No. 644,314

Claims priority, application Fed. Rep. of Germany, Sep. 2, 1983, 3331707

Int. Cl.⁴ B05D *3/06*; C23C *14/00*

U.S. Cl. 427—39 **9 Claims**



1. Method for reactive vapor deposition of compounds of metals and semi-conductors, on at least one substrate by a glow discharge inside a space between a vaporising cathode with a target of metal or semi-conductor and the substrate, feeding separately an inert gas and a reaction gas for the formation of a desired compound, in which the reaction gas is fed to the mass flow in its path from the target to the substrate by means of a distributor arrangement in a plurality of partial streams and in which the glow discharge is concentrated by a closed magnetic field in a region in the neighborhood of the target face, characterised in that

(a) in the space between the target and the substrate there is a flow restriction by means of a diaphragm which amounts to at least 40% of the cross-section of the space,

(b) the inert gas is fed from one side of the diaphragm to the periphery of the target,

(c) the reaction gas is fed through a distributor device situated on the other side of the diaphragm, and

(d) a glow discharge is maintained in the region between the diaphragm and the substrate by an anode exposed to the reaction gas, arranged on the other side of the diaphragm.

4,572,843

METHOD FOR PRODUCING A CAPACITOR WITH PRECISE CAPACITANCE

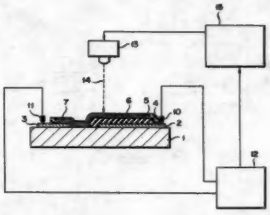
Masayuki Saito, Yokohama; Haruko Suzuki, Yokosuka, and Hirosi Oodaira, Chigasaki, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Feb. 1, 1985, Ser. No. 697,260

Claims priority, application Japan, May 30, 1984, 59-108568

Int. Cl.⁴ H01G *1/01*; B05D *3/06, 5/12*

U.S. Cl. 427—53.1 **8 Claims**



1. A method for producing a capacitor, comprising the steps of:

(1) forming a dielectric layer on a first electrode so as to expose an end portion of said first electrode;

(2) forming on said dielectric layer an insulating composition layer which can be rendered conductive by heating with heat waves;

(3) locally heating said insulating composition layer so as to form a conductor end portion for measuring a capacitance; and

(4) locally and gradually heating said insulating composition layer until a capacitance thereof reaches a predetermined value while measuring the capacitance between said exposed end portion of said first electrode and said conductor end portion for measuring the capacitance, thereby forming a second electrode which is conductive.

8. A method according to claim 1, wherein a laser beam or focused infrared rays are used as a heating source for converting said insulating composition layer into a conductor.

4,572,844

METHOD FOR PREPARING COATED POWDER

Hiroshi Inoue, Kawaguchi; Akihiko Tsuge, Yokohama, and Katsutoshi Komeya, Nakagun, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Apr. 20, 1984, Ser. No. 602,447

Claims priority, application Japan, Apr. 30, 1983, 58-76430

Int. Cl.⁴ B05D *1/12*; C04B *35/52, 35/56*

U.S. Cl. 427—180 **8 Claims**

1. A method for preparing a coated powder which comprises the steps of:

adding a carbon powder and an aluminum nitride powder to a methylsilicic acid powder or a precursor of the methylsilicic acid;

mixing them;

and then subjecting the resulting mixed powder to a heat treatment in an atmosphere including an inert gas or a carbon component-containing gas in order to coat said aluminum nitride powder with silicon carbide which is made by reaction of methylsilicic acid and said carbon powder.

4,572,845

PROCESS FOR GLUING WOOD CHIPS AND THE LIKE WITH LIQUID GLUE AND APPARATUS FOR PERFORMING THE PROCESS

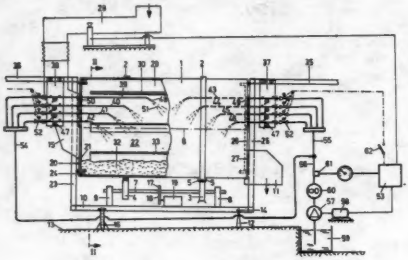
Werner Christen, Mannheim, Fed. Rep. of Germany, assignor to Draiswerke GmbH, Mannheim, Fed. Rep. of Germany

Filed Jun. 15, 1984, Ser. No. 620,890

Claims priority, application Fed. Rep. of Germany, Jul. 5, 1983, 3324106

Int. Cl.[4] B05D 7/00

U.S. Cl. 427—212 3 Claims



1. A process for the continuous gluing of wood chips with liquid glue, the chips being raised from a longitudinally movable chip bed and returned thereto in free fall in the form of chip mists, the glue being exclusively supplied to the chips by pressure atomization by means of a plurality of pressure atomizing nozzles, and the glue distribution taking place in the chip mists substantially over the entire length of the chip bed, wherein alternately at least one nozzle is closed, whilst at least one other nozzle is open, the alternate opening and closing of the nozzles taking place at predetermined time intervals.

4,572,846

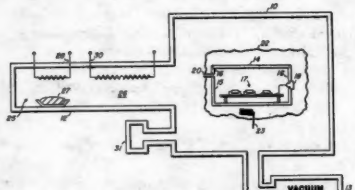
METHOD OF HERMETICALLY SEALING ELECTRONIC PACKAGES

Robert M. Foss, and Gerald R. Severson, both of Scottsdale, Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Nov. 18, 1983, Ser. No. 553,011

Int. Cl.[4] B05D 7/22

U.S. Cl. 427—237 7 Claims



1. A method of hermetically sealing an electronic package comprising the steps of:

providing a sealable port in said package;

introducing a monomer vapor into said package through said port; and

condensing said monomer vapor at least on an interior of said package, whereby a polymer film is formed.

4,572,847

PROCESS FOR RECORDING WITH INK ON A MATERIAL COMPRISING A SUBSTRATE HAVING THEREON A COATING LAYER WITH MICRO-CRACKS

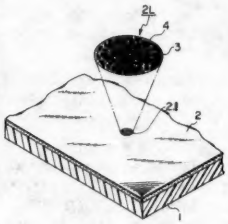
Masahiro Haruta, Funabashi, and Takashi Hamamoto, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 456,381, Jan. 7, 1983, Pat. No. 4,496,629. This application Oct. 31, 1984, Ser. No. 666,680

Claims priority, application Japan, Jan. 12, 1982, 57-3004; Jan. 12, 1982, 57-3005

Int. Cl.[4] B05D 1/12; B32B 5/16; B41M 1/30

U.S. Cl. 427—261 8 Claims



1. A process of recording with ink having coloring matter and a solvent, said process comprising the steps of:

providing a recording material that comprises a substrate and a coating layer thereon, said coating layer having a plurality of micro-cracks therein through which liquid can pass;

capturing the coloring matter of the ink by absorption in the coating layer; and

passing the solvent of the ink through the micro-cracks in the coating layer for absorption by the substrate.

4,572,848

PROCESS FOR THE PRODUCTION OF MOLDED BODIES FROM SILICON-INFILTRATED, REACTION-BONDED SILICON CARBIDE

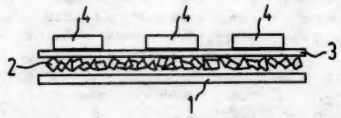
Werner Pollak, Selb/Bayern, Fed. Rep. of Germany; Michael Blecha, Stoob, Austria, and Gerhard Specht, Selb/Bayern, Fed. Rep. of Germany, assignors to Hoechst CeramTec Aktiengesellschaft, Selb/Bayern, Fed. Rep. of Germany

Filed Jul. 27, 1984, Ser. No. 635,201

Claims priority, application European Pat. Off., Jul. 29, 1983, 83107469.5

Int. Cl.[4] B05D 3/00

U.S. Cl. 427—294 11 Claims



1. A process for the siliconizing of porous molded silicon carbide bodies, comprising the steps of:

(a) placing a molded silicon carbide body which contains elemental carbon onto an apparatus comprising a base plate comprising a graphite plate coated with boron nitride and a support plate, comprising a porous plate comprising silicon carbide which is infiltrated with silicon, and a coating which comprises a mixture of boron nitride, silicon carbide and carbon, and a layer comprising silicon therebetween;

(b) heating the molded silicon carbide body and support and base plates under vacuum to a temperature higher than the

melting point of elemental silicon, for a holding time of from about 0.5 to 6 hours, thereby infiltrating the silicon carbide molded body with silicon; and

(c) thereafter cooling the molded body in a nitrogen atmosphere under a pressure of from about 0.05 to 1 bar.

4,572,849

PROCESS FOR THE MULTIPLE COATING OF MOVING WEBS

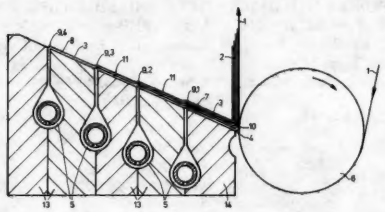
Günther Koepke, Odenthal; Hans Frenken, Odenthal-Osenau; Heinrich Bussmann, and Kurt Browatzki, both of Leverkusen, all of Fed. Rep. of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Oct. 11, 1983, Ser. No. 540,374

Claims priority, application Fed. Rep. of Germany, Oct. 21, 1982, 3238904

Int. Cl.[4] B05D *1/36, 7/00;* G03C *1/74*

U.S. Cl. 427—402 5 Claims



1. A process for the multiple coating of webs by bead coating wherein the web is continuously moving past a coating point and the layers forming the multiple coating are flowing down a sliding surface of a coating head, characterized in that any number of comparatively high viscosity layers having a viscosity of 50 mPas or more is arranged above an accelerating layer which lies below the layers and has a viscosity range of from 1 to 20 mPas and a layer thickness of from 2 to 30 μm, said process avoiding layer intermixing between the accelerating layer and the comparatively high viscosity layers by carrying out a bead formation over a gap width between the sliding surface coating head and the web to be coated of from 100 to 400 μm, preferably from 100 to 200 μm and a pressure is applied under the coating bead which pressure being reduced from the ambient atmosphere pressure in the range of from 0 to 8 mbar, preferably 0 to 3 mbar.

4,572,850

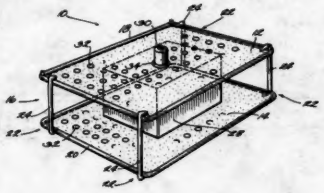
METHOD AND APPARATUS FOR DIP COATING FOAM PATTERNS

Francis V. Bailey, Racine, Wis., assignor to Outboard Marine Corporation, Waukegan, Ill.

Continuation of Ser. No. 624,231, Jun. 25, 1984, abandoned. This application Feb. 7, 1985, Ser. No. 699,485

Int. Cl.[4] B05D *1/18*

U.S. Cl. 427—430.1 19 Claims



1. An apparatus for supporting objects of varied shapes for submersion in a liquid, said apparatus comprising a pair of sheets of elastomeric material, each of said sheets having a perimeter, and frame means for supporting at least a portion of said perimeters of said sheets in generally parallel spaced-apart position such that said sheets will hold an object placed therebetween.

4,572,851

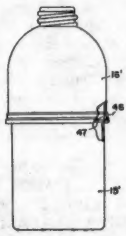
BI-AXIALLY ORIENTED, THIN-WALLED, SYNTHETIC PLASTIC CONTAINER/ARTICLE

Vincent E. Fortuna, Huntington Beach, Calif., assignor to Vercon, Inc., Dallas, Tex.

Division of Ser. No. 190,473, Sep. 24, 1980, Pat. No. 4,466,848. This application Sep. 15, 1983, Ser. No. 520,034

Int. Cl.[4] B65D *23/00*

U.S. Cl. 428—35 2 Claims



1. A synthetic plastics container made by differential pressure forming a thermoplastic container top preform having a top portion and an open ended body portion, the body portion being constituted by a forged side wall which is mechanically squeezed peripherally to compress its molecular and crystalline structure, differential pressure forming a thermoplastic container bottom preform having a bottom and an open ended body portion, the body portion being constituted by a forged side wall which is mechanically squeezed peripherally to compress its molecular and crystalline structure, the side walls of each preform then being mechanically stretched in an axial direction and expanded radially to bi-axially orient the top and bottom sections formed from the preforms, the open ends of the top and bottom sections then being welded together.

4,572,852

THERMOFORMING PARTIALLY CRYSTALLINE POLYESTER ARTICLES

Robert J. Gartland, Youngstown, and Joseph N. Feil, Akron, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Continuation-in-part of Ser. No. 597,776, Apr. 6, 1984, which is a division of Ser. No. 409,219, Aug. 18, 1982, Pat. No. 4,463,121. This application Nov. 5, 1984, Ser. No. 668,061

The portion of the term of this patent subsequent to Jul. 31, 2001, has been disclaimed.

Int. Cl.[4] B65D *1/00;* B32B *27/36;* C08K *5/09*

U.S. Cl. 428—35 17 Claims

1. A thermoformed, non-oriented, heat set, thin wall article, the composition consisting of:

(A) from about 99 to about 90 weight percent of polyethylene terephthalate with an intrinsic viscosity as measured in a 60/40 by volume mixed solvent of phenol/tetrachloroethane at 30° C. from about 0.65 to about 1.2: and

(B) from about 1 to about 10 weight percent of a polyolefin with repeat units derived from olefin monomers containing 2 to 6 carbon atoms; and

(C) an effective amount of a heat stabilizer; said article having a total crystallinity of from about 10 to about 40%.

4,572,853

RESIN ENCAPSULATION TYPE SEMICONDUCTOR DEVICE

Hirotoshi Ikeya, Yokosuka; Shuichi Suzuki, Yokohama; Takayuki Oguni, Yokohama; Kazutaka Matsumoto, Yokohama, and Akiko Hatanaka, Yokohama, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Continuation of Ser. No. 268,324, May 29, 1981, abandoned. This application Feb. 21, 1984, Ser. No. 580,299

Claims priority, application Japan, Jun. 5, 1980, 55-74943; May 8, 1981, 56-68374

Int. Cl.[4] B32B *27/38;* H01B *7/08*

U.S. Cl. 428—76 12 Claims

1. A resin encapsulation type semiconductor device comprising a semiconductor device encapsulated within a cured epoxy resin composition, said epoxy resin composition comprising (a) an epoxy resin containing a hydrolyzable chlorine in an amount less than 0.1% by weight, (b) a novolac resin containing phenolic hydroxyl groups in a ratio of about 0.5 to about 1.5 relative to the epoxy groups possessed by said epoxy resin, and (c) 0.001 to 20 parts by weight of an organic tertiary phosphine compound per 100 parts by weight of the sum of said epoxy resin and said novolac resin.

4,572,854

MULTILAYER FILM WITH A GAS AND AROMA BARRIER LAYER AND A PROCESS FOR THE PREPARATION AND APPLICATION THEREOF

Hermann Dallmann, Wiesbaden, and Hans J. Palmer, Walluf, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Feb. 25, 1986, Ser. No. 582,552

Claims priority, application Fed. Rep. of Germany, Feb. 23, 1983, 3306189

Int. Cl.[4] B32B *27/00*

U.S. Cl. 428—35 30 Claims

1. A multilayer film which comprises:

(a) an inner barrier layer D comprised of a saponified ethylene-vinyl alcohol copolymer which contains about 15 to about 60 mole % ethylene units and which is saponified to at least approximately 90%, said inner barrier layer presenting a first surface and a second surface;

(b) on at least one of said first and second surfaces, an adhesion-promoting layer C comprised of a modified polyolefin; and

(c) adjacent to said adhesion-promoting layer, a layer B comprised of at least one polymer selected from the group consisting of a polypropylene homopolymer, a propylene copolymer, and said modified polyolefin,

wherein all of the layers of said multilayer film are coextruded to form a multilayer composite, which is then biaxially oriented under substantially the same stretching conditions to form said multilayer film.

4,572,855

LABEL TAPE

Peter Kalus, Neckargemünd, and Gerhard Wippern, Hirschhorn-Langental, both of Fed. Rep. of Germany, assignors to Esselte Pendaflex Corporation, Garden City, N.Y.

Filed Sep. 22, 1983, Ser. No. 534,705

Claims priority, application Fed. Rep. of Germany, Sep. 30, 1982, 8227503[U]

Int. Cl.[4] B65D *65/28;* G09F *3/00*

U.S. Cl. 428—43 4 Claims

1. A label tape of successive individual labels which are to be appended to articles for sale, said label tape being for use in a hand labelling device in which each label is provided with an imprint and then dispensed from the labelling device, said label tape comprising a carrier layer formed of a film consisting essentially of polyethylene and a printable layer firmly bonded to said film where each label is provided with said imprint on the side of said imprintable paper layer opposite the side thereof bonded to the carrier layer, said labels being separated from one another by separating cuts which extend through both the carrier layer and the printable layer, the separating cuts extending transversely with respect to the tape direction, whereby due to said material of the carrier layer, the label can be safely transported through the hand labelling device without tearing and, due to the separating cuts, each label can be readily torn from the label tape in such a manner that the carrier layer and the paper layer remain bonded together after each label is torn from the label tape.

4,572,856

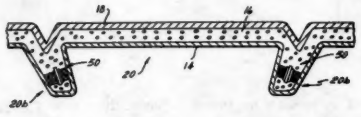
COMPOSITE MOLDED ARTICLE AND PROCESS USING SELF-POSITIONING LAMINATED STIFFENER

John C. Gembinski, Dover, N.H., assignor to Ex-Cell-O Corporation, Troy, Mich.

Filed Nov. 5, 1984, Ser. No. 668,602

Int. Cl.[4] B32B *1/04, 3/02*

U.S. Cl. 428—71 26 Claims



13. A molded composite article having an outer decorative layer, an intermediate foam layer and an inner support layer forming a main body wherein an appendage of the article extends away from the main body to such an extent that the outer decorative layer faces itself rather than the support layer with the foam layer between the facing outer layer, said article further having a stiffener means in the foam layer of the appendage between the facing outer decorative layer, said stiffener means including a stiffener member having opposite sides facing and spaced from the facing outer decorative layer and a partially compressed, porous, resilient layer attached to said sides extending therefrom into contact with the outer decorative layer and impregnated with the foam layer by virtue of said stiffener means being in place between the facing outer decorative layer when the foam layer is formed therebetween.

4,572,857

INSULATING BOARD OF COMPOSITE MATERIAL

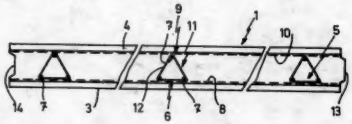
Marc Bekaert, Moorslede, Belgium, assignor to N.V. Maatschappij Voor Studie, Bijstand en Onderzoek "M.S.B.O.", Moorslede, Belgium

Filed Feb. 6, 1985, Ser. No. 698,718

Claims priority, application Belgium, Feb. 15, 1984, 212390

Int. Cl.[4] B32B *3/12, 7/04, 19/00*

U.S. Cl. 428—117 4 Claims



1. A composite roof construction panel board (1), comprising:

(a) a planar sheet of perlite-based material (3),

(b) a three-dimensional framework (5) disposed atop the perlite-based sheet and comprising:
(1) a first planar sheet of metal reinforcing mesh (8) overlying one face of the perlite-based sheet,
(2) a plurality of spaced, parallel, latticed beams (11) overlying the first mesh sheet, each beam comprising a plurality of elongate metal rods (7) disposed parallel to one another and interconnectd by skewed cross-members (12), and
(3) a second planar sheet of metal reinforcing mesh (10) overlying the beams, and
(c) a foamed plastic core (2) embedding the framework and binding the beams and mesh sheets together to establish three-dimensional rigidity without welding the beams to the mesh sheets.

4,572,858

PROCESS FOR TEXTURIZED BLOWN FILM AND RESULTING PRODUCT

Chi C. Young, Gulf Breeze, Fla., assignor to American Cyanamid Company, Stamford, Conn.

Filed Nov. 23, 1984, Ser. No. 674,431
Int. Cl.[4] B32B *3/00*
U.S. Cl. 428—141 8 Claims

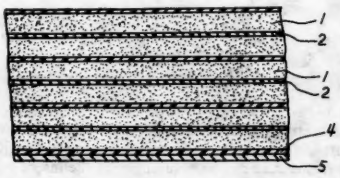
6. A biaxially oriented foamed film having an inherent textured surface and an inherent fibrous web reinforcement comprising a major amount of one or more polymers selected from acrylonitrile and olefin polymers and a minor amount of polytetrafluoroethylene, the amount of polytetrafluoroethylene being sufficient to provide said inherent properties.

4,572,859

ELECTRICAL LAMINATE COMPRISING A PLURALITY OF FIBROUS LAYERS AND CURED RESIN LAYERS

Yasuo Fushiki, Takatsuki; Masaharu Abe, and Masayuki Oizumi, both of Kobe, all of Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 559,991, Dec. 9, 1983, abandoned, which is a continuation of Ser. No. 267,355, May 26, 1981, abandoned. This application Apr. 15, 1985, Ser. No. 722,762
Claims priority, application Japan, May 26, 1980, 55-70466; May 26, 1980, 55-128935; Sep. 16, 1980, 55-198936; Sep. 16, 1980, 55-198937; Sep. 16, 1980, 55-198938; Sep. 22, 1980, 55-132157
Int. Cl.[4] B32B *7/00*
U.S. Cl. 428—215 13 Claims



1. An electrical laminate comprising a plurality of fibrous substrate layers and layers of a cured resin selected from the group consisting of an epoxy resin and an unsaturated polyester resin alternately disposed between and substantially extending over the surface of said substrate layers to form a unitary laminate, each of said substrate layers being embedded in a matrix of a cured resin which is substantially integral with the adjacent layers of cured resin, said substrate layers consisting generally of cellulosic fibers, the surface of the cellulosic fibers having thereon a coating comprising a methylol group-containing resin and characterized in that the amount of coating is in the range of 5 to 30% by weight of the dry substrate in terms of pick-up on a dry basis.

4,572,860

THERMAL TRANSFER RECORDING MEDIUM

Masaki Nakamura; Takao Abe; Kunihiro Koshizuka; Shigehiro Kitamura; Fumio Ishii, and Yuji Hotta, all of Hino, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Oct. 3, 1984, Ser. No. 657,574
Claims priority, application Japan, Oct. 12, 1983, 58-189295; Dec. 26, 1983, 58-244266
Int. Cl.[4] B41M *5/26*
U.S. Cl. 428—216 20 Claims

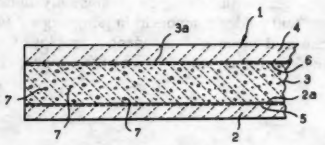
1. A thermal transfer recording medium comprising a support, a coloring agent layer containing a heat fusible substance formed on one surface of said support and a backing layer on the other surface of said support, wherein said backing layer contains a resin selected from the group consisting of urethane resins and vinyl chloride resins, and a higher fatty acid which is solid or meta-solid at room temperature.

4,572,861

PREFABRICATED ELEMENT FOR USE IN PARTICULAR IN THE BUILDING INDUSTRY AND A METHOD OF MANUFACTURE OF SAID PREFABRICATED ELEMENT

Manuel Barretto Garcia, and Aurora Zapata Oviedo, both of Caracas, Venezuela, assignors to Consultora Sides C.A., Caracas, Venezuela

Filed Jun. 12, 1984, Ser. No. 620,080
Claims priority, application France, Jun. 17, 1983, 83 10029
Int. Cl.[4] B32B *5/02*
U.S. Cl. 428—240 9 Claims



1. A prefabricated element (1, 8, 18) which is primarily intended for the building industry and is composed of a plurality of parallel layers bonded to each other, wherein said element comprises:
a first layer (2, 9, 19) of low-density mortar in which a sheet (5, 16, 22) of woven mineral fibers extends in substantially parallel relation to and in proximity to the internal surface of said layer;
at least one intermediate layer (3, 11, 21) having a composition which is identical with that of the first layer but is additionally filled with particles (7) of low-density heat-insulating material, said intermediate layer being provided in the same manner as the first layer (2, 9, 19) with a sheet (6, 17, 23) of woven mineral fibers extending in substantially parallel relation to and in proximity to the intermediate-layer surface which is remote from said first layer;
a last layer (4, 10, 20) which is identical in composition with the first layer but does not contain a sheet of woven mineral fibers, the first layer (2, 9, 19) and the last layer (4, 10, 20) having the following composition by weight:
gypsum: 38 to 54%
lime: 4 to 15%
cement: 2.5 to 6%
quarta dust: 2 to 5%
organic resin: 0.7 to 3.5%
water: 28 to 40%.

4,572,862

FIRE BARRIER COATING COMPOSITION CONTAINING MAGNESIUM OXYCHLORIDES AND HIGH ALUMINA CALCIUM ALUMINATE CEMENTS OR MAGNESIUM OXYSULPHATE

Harold Ellis, Miami, Fla., assignor to Delphic Research Laboratories, Inc., Miami, Fla.

Filed Apr. 25, 1984, Ser. No. 603,799
Int. Cl.[4] C04B 7/32, 9/00
U.S. Cl. 428—245 18 Claims

1. A composition suitable for use as a fire barrier when cured, said composition comprising a flowable, substantially uniform dispersion of:

(A) a binder component comprising a powdered, substantially uniform mixture of

(1) heat activated MgO, and

(2) high-alumina calcium aluminate cement comprising 70% to 80% Al_2O_3; in

(B) a gauging component in about a stoichiometric amount sufficient to react with said binder component, wherein the gauging component comprises an aqueous solution of $MgCl_2$ or $MgSO_4$, wherein the aqueous solution has a specific gravity of about 26° to about 32° Baume.

15. A method of making a composition according to claim 1 comprising:

(A) preparing a substantially dry, powdered binder component comprising

(1) heat activated MgO, and

(2) high-alumina calcium aluminate cement comprising 70% to 80% Al_2O_3;

(B) preparing a gauging component comprising an aqueous solution of $MgCl_2$ or $MgSO_4$, wherein the aqueous solution has a specific gravity of about 26° to about 32° Baume;

(C) gradually adding said binder component to said gauging component with mixing to substantially uniformly disperse said binder component in said gauging component; wherein said gauging component is employed in about a stoichiometric amount relative to said binder component.

4,572,863

AQUEOUS POLYESTER/EPOXY EMULSION TREATMENT FOR YARN, METHOD OF PREPARATION AND A RUBBER/CORD COMPOSITE

Daniel A. Chung, North Canton, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Jul. 29, 1985, Ser. No. 759,726
Int. Cl.[4] B32B 7/00
U.S. Cl. 428—250 17 Claims

5. A textile fabric composite comprised of (A) a cord or fabric thereof composed of fibers of polyester and (B) an adhesive coating thereon formed by the steps of (1) applying an aqueous emulsion composition coating to said fabric and (2) drying the coated fabric, wherein said aqueous emulsion composition is prepared by the process which comprises:

(a) reacting a water emulsifiable polyester with a hindered diisocyanate at a mole ratio of from 1.5:1 to 2.5:1 diisocyanate to polyester, to form a prepolymer:

(b) combining the prepolymer with an epoxy resin at a weight ratio of 2:1 to 20:1 prepolymer to epoxy resin; and then

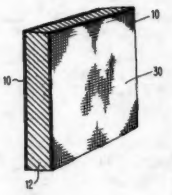
(c) adding this mixture to water to yield an emulsion with solids content from 2 to 50 parts by weight per 100 parts of emulsion.

4,572,864

COMPOSITE MATERIALS FOR THERMAL ENERGY STORAGE

David K. Benson, Golden; Richard W. Burrows, Conifer, and Yvonne D. Shinton, Northglenn, all of Colo., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jan. 4, 1985, Ser. No. 688,668
Int. Cl.[4] C09K 3/18; B32B 9/00
U.S. Cl. 428—305.5 28 Claims



1. A composite material for thermal energy storage comprising a solid state phase change material selected from the group consisting of pentaerythritol, pentaglycerine, neopentyl glycol, tetramethylol propane, monoaminopentaerythritol, diaminopentaerythritol, tris(hydroxymethyl)acetic acid, and mixtures thereof; said solid state phase change material contacting materials selected from the group consisting of metals, carbon siliceous, plastic, cellulosic, natural fiber, artificial fiber, concrete, gypsum, porous rock, and mixtures thereof.

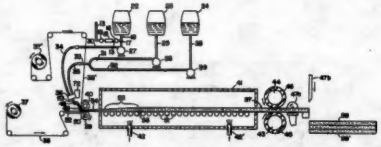
10. The composite material of claim 1, wherein said solid state phase change material is laminated between facing sheets comprising said contact materials.

4,572,865

FACED FOAM INSULATION BOARD AND FROTH-FOAMING METHOD FOR MAKING SAME

David G. Gluck, St. Petersburg; Alberto DeLeon, Clearwater, and John P. Oliver, St. Petersburg, all of Fla., assignors to The Celotex Corporation, Tampa, Fla.

Filed Dec. 5, 1983, Ser. No. 558,136
Int. Cl.[4] B32B 5/20; C08J 9/30; B29C 67/22, 39/18
U.S. Cl. 428—309.9 54 Claims



1. A method for continuously producing an insulation board comprising a rigid plastic foam core having two major surfaces and a facing material on at least one of the major surfaces, the method comprising:

(a) conveying a facing material along a production line,

(b) depositing a partially expanded froth foam, which contains at least one frothing agent, on the facing material, the partially expanded froth foam comprising a mixture for forming a rigid polymer foam selected from the group consisting of polyurethane, polyisocyanurate, phenolic polymer, polyester and epoxide foams, and the frothing agent being easily vaporizable at atmospheric pressure, and

(c) further expanding and curing the froth foam in contact with the facing material to form the insulation board.

41. An insulation board comprising a core of rigid plastic foam having two major, substantially parallel surfaces and a facing material on at least one of the major surfaces of the core,

the foam core being formed in accordance with the method of claim 1 by further expanding a partially expanded froth foam in contact with the facing material, and the cells of the resulting foam core containing the volatile frothing agent employed in the method.

4,572,866

MAGNETIC RECORDING MEDIUM

Issei Nakamura, and Kenji Itozawa, both of Hachioji, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Oct. 26, 1983, Ser. No. 545,662
Claims priority, application Japan, Oct. 29, 1982, 57-190275
Int. Cl.[4] G11B 5/68
U.S. Cl. 428—328 20 Claims

1. A magnetic recording medium comprising a support and a magnetic layer on said support,

said magnetic layer being a unitary magnetic layer comprising ferromagnetic metallic powder, the average grain size of said ferromagnetic powder being not more than 0.5μ, the ratio of the major axis to the minor axis (acicular ratio) of said powders being from 1.3 to 4.5 and the coercive force of said powders being from 550 to 800 Oe.

4,572,867

MAGNETIC RECORDING MEDIUM

Issei Nakamura, and Kenji Itozawa, both of Hachioji, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Oct. 26, 1983, Ser. No. 545,663
Claims priority, application Japan, Oct. 29, 1982, 57-190276
Int. Cl.[4] G11B 5/70
U.S. Cl. 428—328 20 Claims

1. A magnetic recording medium comprising a support and a magnetic layer on said support,

said magnetic layer being a unitary magnetic layer comprising ferromagnetic metallic powder, the average grain size of said ferromagnetic powder being not more than 0.5μ, the ratio of the major axis to the minor axis (acicular ratio) of said ferromagnetic powder being from 1.3 to 4.5, and the coercive force of said ferromagnetic powder being from 1350 Oe to 1600 Oe.

4,572,868

ANTI-CORROSIVE SEALING TAPE

Nobuyoshi Hosaka, Minori, and Tasuku Shimizu, Hitachi, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 16, 1984, Ser. No. 600,963
Claims priority, application Japan, Apr. 15, 1983, 58-65367
Int. Cl.[4] B32B 5/16
U.S. Cl. 428—328 5 Claims

1. An anti-corrosive sealing tape which can protect metal pipes or structural members cathodically against corrosion when wrapped around them, which comprises a first layer containing a rubber base, 5 to 350% of fine zinc powder, 2 to 10% of magnesium oxide, and 20 to 200% of graphite powder based on the weight of the rubber base and a second layer for reinforcing the first layer and for imparting water-proofness to the sealing tape thereby maintaining the anti-corrosive effect for a long period.

4,572,869

MICROCAPSULAR OPACIFIERS AND METHOD FOR THEIR PRODUCTION

Marco Wismer, Gibsonia, and Jerome A. Seiner, Pittsburgh, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Continuation of Ser. No. 262,894, Jun. 14, 1972, abandoned, which is a division of Ser. No. 852,055, Aug. 21, 1969, Pat. No. 4,007,141, which is a continuation-in-part of Ser. No. 632,392, Apr. 20, 1967, abandoned. This application Jul. 12, 1974, Ser. No. 488,099
Int. Cl.[4] B01J 13/02; C09D 5/00
U.S. Cl. 428—402.24 35 Claims

13. A method for the production of microcapsular opacifiers which comprises providing discrete, essentially spherical precursor microcapsules having substantially continuous organic, polymeric, solid walls, said microcapsules having an average particle diameter of below about 2 microns and containing a liquid core material, said microcapsules additionally having pigment particles incorporated in the microcapsular structure, and heating said microcapsules to a temperature sufficient to substantially completely drive off said core material from said microcapsules and replace said liquid core material with air.

20. Microcapsular opacifiers consisting essentially of discrete, substantially spherical, air-containing microcapsules having substantially continuous, organic, polymeric, solid walls and an average particle diameter of below about 2 microns, said microcapsules additionally having pigment particles incorporated in the microcapsular structure.

4,572,870

CHLOROSULFONATED ETHYLENE VINYL ACETATE POLYMER COATING COMPOSITION

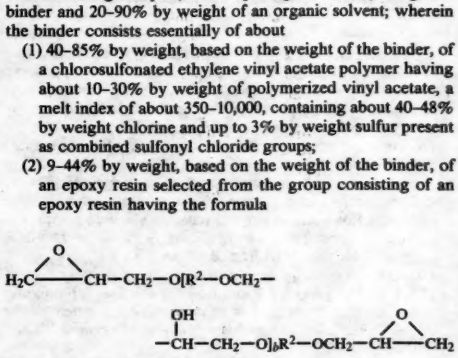
Joseph A. Vasta, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 639,081, Aug. 9, 1984, abandoned. This application Dec. 28, 1984, Ser. No. 687,364
Int. Cl.[4] C08L 23/34, 63/02, 63/04
U.S. Cl. 428—416 23 Claims

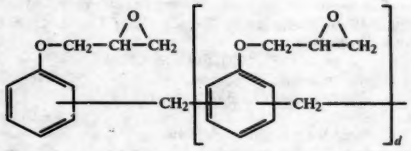
1. A coating composition comprising 10–80% by weight of binder and 20–90% by weight of an organic solvent; wherein the binder consists essentially of about

(1) 40–85% by weight, based on the weight of the binder, of a chlorosulfonated ethylene vinyl acetate polymer having about 10–30% by weight of polymerized vinyl acetate, a melt index of about 350–10,000, containing about 40–48% by weight chlorine and up to 3% by weight sulfur present as combined sulfonyl chloride groups;

(2) 9–44% by weight, based on the weight of the binder, of an epoxy resin selected from the group consisting of an epoxy resin having the formula



where R^2 is an aromatic radical and b is a positive integer of about 0.5 to 4, and an epoxy novolac resin of the formula



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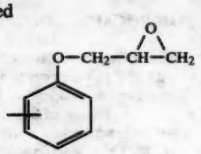
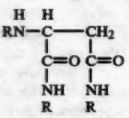


where d is a positive integer of about 0.2–2,

(3) 3–20% by weight, based on the weight of the binder, of a polyamine curing agent of the formula



where R is R^1NH_2 and R^1 is an aliphatic or cycloaliphatic radical; and

(4) 0.1–3% by weight, based on the weight of the binder, of a bicyclic amidine.

2. The coating composition of claim **1** containing pigment in a pigment-to-binder weight ratio of about 20:100 to 200:100.

22. A substrate coated with a cured layer of the composition of claim **1**.

23. A metal substrate coated with a cured primer layer of the composition of claim **2** and having in superimposed adherence to the primer layer a cured layer of a fluorocarbon polymer comprising vinylidene fluoride and hexafluoropropylene.

4,572,871

GLASS-RUN FOR WINDOW GLASS OF MOTOR CAR

Akira Mabuchi, and Kenji Yano, both of Aichi, Japan, assignors to Toyoda Gosei Co., Ltd., Nishikasugai, Japan

Filed Oct. 23, 1984, Ser. No. 664,030

Claims priority, application Japan, Oct. 27, 1983, 58-200084

Int. Cl.[4] B32B *27/00*

U.S. Cl. 428—423.1 **2 Claims**

1. A glass-run for a window glass moving to open and close of a motor car, which comprises a substrate material having a film coated on at least a part of the surface of the substrate to be contacted with the window glass, said film being formed by hardening a paint composition comprising:

(A) 100 parts by weight of an urethane prepolymer obtained by the reaction of a polyester polyol having hydroxy groups in its terminal and a molecular weight of 1,000 to 3,000, synthesized from a saturated diol having 2 to 6 carbon atoms and an organic dicarboxylic acid having 4 to 6 carbon atoms, with an organic diisocyanate in the molar ratio of NCO/OH of from 0.6/1 to 0.95/1;

(B) 10 to 60 parts by weight of a castor oil polyol;

(C) 1 to 100 parts by weight of an urethane prepolymer having isocyanate groups in its terminal obtained by the reaction of a low molecular polyol and an organic diisocyanate;

(D) 2 to 100 parts by weight of a fluoro resin; and

(E) 5 to 100 parts by weight of a silicone oil.

4,572,872

GLASS-RUN FOR WINDOW GLASS OF MOTOR CAR

Yoshio Yamazaki; Akira Mabuchi, and Kenji Yano, all of Haruhi, Japan, assignors to Toyoda Gosei Co., Ltd., Nishikasugai, Japan

Filed Jan. 30, 1985, Ser. No. 696,494

Claims priority, application Japan, Feb. 3, 1984, 59-16964

Int. Cl.[4] B32B *27/00*

U.S. Cl. 428—423.1 **4 Claims**

1. A glass-run for a window glass moving to open and close of a motor car, which comprises a substrate having a film coated on at least a part of the surface of the substrate to be contacted with the window glass, said film being formed by hardening a paint composition comprising:

(A) 100 parts by weight of an urethane polymer obtained by the reaction of a polyester polyol having hydroxy groups in it's terminal and a molecular weight of 1,000 to 3,000, synthesized from a saturated diol having 2 to 6 carbon atoms and an organic dicarboxylic acid having 4 to 6 carbon atoms, with an organic diisocyanate in the molar ratio of NCO/OH of from 0.6/1 to 0.95/1;

(B) 10 to 60 parts by weight of a castor oil polyol;

(C) 1 to 100 parts by weight of an urethane prepolymer having isocyanate groups in it's terminal obtained by the reaction of a low molecular polyol and an organic diisocyanate;

(D) 2 to 100 parts by weight of a fluoro carbon resin;

(E) 5 to 100 parts by weight of a silicone oil; and

(F) 0.5 to 3 parts by weight of at least one member of silica, clay, and calcium carbonate.

4,572,873

TITANIUM DISULFIDE THIN FILM AND PROCESS FOR FABRICATING THE SAME

Keiichi Kanehori, Sayama; Katsuki Miyauchi, Hino, and Tetsuichi Kudo, Tokyo, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 531,706, Sep. 13, 1983, abandoned. This application Feb. 19, 1985, Ser. No. 702,661

Claims priority, application Japan, Sep. 13, 1982, 57-158123

Int. Cl.[4] B32B *9/00, 17/06*

U.S. Cl. 428—432 **15 Claims**

1. A titanium disulfide film fabricated by chemical vapor deposition on a substrate, which comprises crystallites of titanium disulfide each being oriented at an angle of its c-axis to the substrate surface of not more than 45° on average.

8. A titanium disulfide film according to claim **1**, wherein the substrate is made of a material selected from the group consisting of quartz, silicon and alumina.

4,572,874

POLYTERPENE RESIN COMPOSITION CONTAINING A BLEND OF LOW MOLECULAR WEIGHT POLYETHYLENE BASED POLYMERS

Irving B. Chang, and Robert E. Beckwith, both of Morristown, N.J., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Filed Dec. 20, 1984, Ser. No. 684,218

Int. Cl.[4] C08L *23/06, 23/08, 23/30*

U.S. Cl. 428—523 **10 Claims**

1. A composition comprising:

a polyterpene resin; and

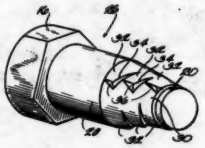
from 15 to 40 percent based on the weight of the polyterpene resin of at least two polyolefin polymers selected from the group consisting of polyethylene homopolymers, polyethylene copolymers selected from the group consisting of the copolymer of ethylene and at least one other unsaturated monomer selected from the group of consisting of unsaturated carboxylic acids, salts of said acids, and esters of said acids, and oxidized polyethylene, there being at least one polyolefin selected from polyethylene copolymers and oxidized polyethylene, the polyolefin polymers having a number average molecular weight of from about 500 to about 8,000, the relative amounts of the polyolefins being sufficient to result in the composition which can form a film having a glossy surface.

4,572,875

BLANK FOR A THREAD FORMING SCREW

Charles E. Gutshall, 2911 E. State St., Rockford, Ill. 61108

Filed Jan. 11, 1984, Ser. No. 569,823
Int. Cl.[4] B21H 3/04
U.S. Cl. 428—585 7 Claims



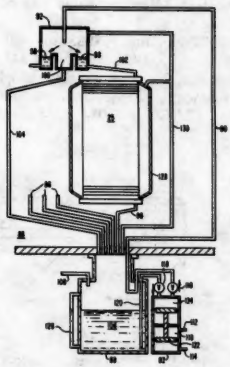
1. An elongated blank for use in manufacture of a thread forming screw having helical screw threads, said threads including crests, said elongated blank comprising an elongated substantially cylindrical shank portion having a longitudinal axis and opposite ends, means at one of said opposite ends adapted to be cooperable with a tool for turning the thread forming screw, the other of said opposite ends of said cylindrical shank portion being adapted to be threaded to form a work entering tapered thread forming pilot portion, said other end of said cylindrical shank portion including a plurality of steps spaced apart in the direction of said longitudinal axis, each of said steps including a shoulder generally defining a plane transverse to said longitudinal axis and said shoulder facing said other end of said cylindrical shank, and each of said steps including an end wall defining a surface transverse to said plane of said shoulder.

4,572,876

APPARATUS FOR SUPPLYING ELECTROLYTE TO FUEL CELL STACKS

Francis R. Spurrier, Whitehall, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 1, 1985, Ser. No. 718,773
Int. Cl.[4] H01M 8/04
U.S. Cl. 429—34 8 Claims



1. In a fuel cell module having at least two fuel cell stacks, each said fuel cell stack comprising a plurality of fuel cells, each said fuel cell including in a horizontal orientation an anode electrode, a cathode electrode, a porous matrix sandwiched between said electrodes, a top bipolar plate and a bottom bipolar plate, each said fuel cell stack further comprising fuel path means and oxidant path means each extending in a horizontal direction, and electrolyte passage means for guiding electrolyte through each said fuel cell in said fuel cell stack for wetting each said porous matrix with electrolyte,

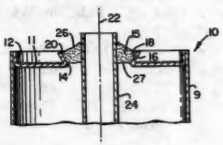
electrolyte supply apparatus for supplying electrolyte to said electrolyte passing means of each said fuel cell stack in said fuel cell module as required to keep the matrix-electrode interfaces wetted with electrolyte, said supply apparatus comprising pump means for delivering a predetermined pumped volume of electrolyte in periodic pulses of predetermined duration from electrolyte reservoir means through electrolyte transfer means to electrolyte distribution means, said electrolyte distribution means dividing said electrolyte pumped volume into as many electrolyte streams as there are fuel cell stacks in said fuel cell module and delivering each said electrolyte stream to stack supply means for transporting the electrolyte from each said electrolyte stream to said electrolyte passage means of each said fuel cell stack, each said periodic pulse of electrolyte provided by said pump means being of a sufficiently short duration that said electrolyte streams produced within said electrolyte distribution means have ceased before any electrolyte has reached said fuel cell stacks by way of said stack supply means so that a short circuit is not created by the potential difference between said fuel cell stacks through the electrically conductive electrolyte, and said electrolyte supply apparatus also comprising drainage means for returning electrolyte not absorbed by said porous matrices to said reservoir means.

4,572,877

HERMETIC SEAL FOR AN ELECTROCHEMICAL CELL

Ernest D. Botos, Bay Village, Ohio, assignor to Union Carbide Corporation, Danbury, Conn.

Filed Jun. 27, 1985, Ser. No. 749,226
Int. Cl.[4] H01M 2/12
U.S. Cl. 429—53 12 Claims



1. An electrochemical cell system disposed in a housing comprising a container having an open end closed by a cover sealed in the open end and including means for venting said housing responsive to a pressure build up within the housing comprising:

(a) said housing including a portion having a flared flange defining a vent passageway through said housing with a first opening of said passageway facing into said housing and a second opening of said passageway facing to the exterior of said housing, said first opening being smaller than said second opening; and

(b) an electrically insulating material hermetically sealed within said passageway.

4,572,878

BATTERY TEMPERATURE SENSOR AND HOUSING THEREFOR

James D. Daugherty, Brookfield, Ohio, assignor to General Motors Corporation, Detroit, Mich.

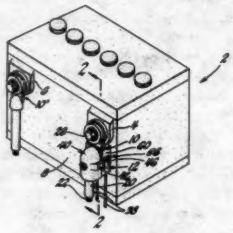
Filed Dec. 19, 1984, Ser. No. 683,349
Int. Cl.[4] H01M 2/00, 16/50
U.S. Cl. 429—62 7 Claims

1. Device for externally sensing the approximate temperature of the electrolyte of an electrical storage battery through

a wall of the battery's container for controlling the recharge of the battery at various temperatures comprising:

a temperature sensor;

a discrete housing embedding said sensor, said housing being adapted for mounting to the underside of a battery cable terminal and for pressing against said wall, and



means astride said terminal for securing said housing to said terminal such as to position said sensor in heat conductive relation to said wall beneath the electrolyte level in said container when said cable is coupled to said battery.

4,572,879

LEAD-ACID CELL AND METHOD OF PRODUCING SAME

Yuji Morioka, Hyogo, Japan, assignor to Sanyo Electric Co., Ltd., Japan

PCT No. PCT/JP82/00282, § 371 Date Mar. 9, 1983, § 102(e) Date Mar. 9, 1983, PCT Pub. No. WO83/00583, PCT Pub. Date Feb. 17, 1983

PCT Filed Jul. 21, 1982, Ser. No. 482,994

Claims priority, application Japan, Jul. 31, 1981, 56-121009; Aug. 3, 1981, 56-115765[U]; Apr. 16, 1982, 57-64541; May 7, 1982, 57-66954[U]; May 12, 1982, 57-80493

Int. Cl.⁴ H01M *4/14*

U.S. Cl. 429—94 **4 Claims**

1. A lead acid cell, which comprises:

a negative electrode;

a positive electrode; and

a separator interposed between the negative and positive electrodes, the separator being adapted to retain an electrolyte, the positive electrode including an active material layer, a net-like body of resin embedded in the active material layer, a current collector having a solid, plate-like structure, and an electrolyte-resistant band-like insulation layer, the solid current collector being placed in close contact with a surface of the active material layer, the solid current collector being formed of lead or lead alloy, the current collector including a terminal take-out portion, the insulation layer being interposed partly between the current collector and the active material layer and extending toward the terminal take-out portion.

4,572,880

METHOD OF MANUFACTURING FLUORESCENT SCREENS

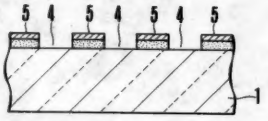
Kiyoshi Miura, Mobara, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 87,022, Oct. 22, 1979. This application Apr. 15, 1981, Ser. No. 254,308

Claims priority, application Japan, Oct. 25, 1978, 53-130554

Int. Cl.⁴ G03C *5/00*

U.S. Cl. 430—25 **8 Claims**



1. A method of forming a black matrix film on an inner surface of a panel of a color picture tube for receiving phosphor picture elements of different colors at predetermined locations to form a fluorescent screen, consisting of the steps of forming a graphite film on an inner surface of a panel of said color picture tube, forming a reflective film on said graphite film, forming a positive type photoresist film on said reflective film, said positive type photoresist film being insoluble in an aqueous solution of an alkali when not exposed to light but made soluble in said aqueous solution of an alkali upon exposure to light, exposing to light portions of said photoresist film where said phosphor picture elements of different colors are to be formed subsequently, removing said exposed portions of said photoresist film by means of an aqueous solution of an alkali to expose portions of said reflective film, and then removing said exposed portions of said reflective film and portions of said graphite film underlying the same to form a pattern of black matrix film corresponding to unexposed portions of said photoresist film with voids therein at predetermined locations corresponding to the exposed portions of said photoresist film.

4,572,881

PRINTING MEMBER FOR ELECTROSTATIC PHOTOCOPYING

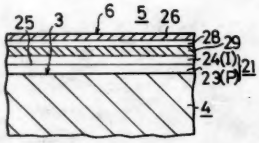
Shunpei Yamazaki, 21-21 Kitakarasuyama 7-chome, Setagaya-ku, Tokyo, Japan

Division of Ser. No. 502,583, Jun. 9, 1983, which is a division of Ser. No. 276,503, Jun. 23, 1981, Pat. No. 4,418,132. This application Apr. 24, 1984, Ser. No. 603,419

Claims priority, application Japan, Jun. 25, 1980, 55-86801

Int. Cl.⁴ G03G *5/082, 5/14*

U.S. Cl. 430—57 **11 Claims**



1. A printing member for electrostatic photocopying comprising:

a substrate having a conductive surface; a photoelectrically-sensitive, electrically chargeable layer on the conductive surface of the substrate;

wherein the photoelectrically-sensitive, electrically chargeable layer has a photoelectrically-sensitive non-single crystal semiconductor layer on the substrate, a charge storing non-single crystal semiconductor layer on the photoelectrically-sensitive non-single crystal semiconduc-

tor layer and a chargeable layer formed on the charge storing non-single crystal semiconductor layer and permeable to light and electrical carriers and wherein the charge storing non-single crystal semiconductor layer has a smaller energy band gap than the chargeable layer and the region of the photoelectrically-sensitive non-single crystal semicondutor layer on the side of the charge storing non-single crystal semiconductor layer;

wherein the non-single crystal semiconductor layer has a first layer on the substrate and a second layer on the first layer to create a transition region;

wherein each of said first, second, and charge storing layers is formed principally from material selected from the group consisting of Si, Si_3N_{4-x} $(0<x<4)$, SiC_{1-x} $(0<x<1)$, or SiO_{2-x} $(0<x<2)$ and contains material selected from the group consisting of hydrogen, chlorine, or fluorine; and

wherein the first layer is P or N type and the second layer is I type, and the transition region is PI of NI depending on whether the first region is P or N type.

4,572,882

PHOTOCONDUCTIVE MEMBER CONTAINING AMORPHOUS SILICON AND GERMANIUM

Keishi Saitoh, Ibaraki; Yukihiko Ohnuki, Kawasaki, and Shigeru Ohno, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 6, 1984, Ser. No. 647,693

Claims priority, application Japan, Sep. 9, 1983, 58-167073; Sep. 13, 1983, 58-170380; Nov. 7, 1983, 58-208812; Dec. 27, 1983, 58-244739; Dec. 28, 1983, 58-245302; Dec. 28, 1983, 58-245306

Int. Cl.⁴ G03G *5/082*

U.S. Cl. 430—57 **74 Claims**

1. A photoconductive member comprising a substrate for a photoconductive member and a light receiving layer having photoconductivity comprising an amorphous material containing silicon atoms and germanium atoms, the light receiving layer containing nitrogen atoms and having a first layer region (1), a third layer region (S), and a second layer region (2) of nitrogen atom distribution concentrations C(1), C(3), and C(2), respectively, in the layer thickness direction, in that order from the substrate side to the opposite side, wherein C(3) is higher than any of C(2) and C(1) and one of C(1) and C(2) is not zero.

4,572,883

ELECTROPHOTOGRAPHIC IMAGING MEMBER WITH CHARGE INJECTION LAYER

Geoffrey M. T. Foley, Fairport, and Harvey J. Hewitt, Williamson, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Jun. 11, 1984, Ser. No. 619,109

Int. Cl.⁴ G03G *5/14*

U.S. Cl. 430—58 **16 Claims**

1. An electrophotographic imaging member comprising a substrate, a distinct continuous layer of an amorphous hole injecting material having a thickness of less than about 10 micrometers, said amorphous hole injecting material consisting essentially of selenium and between about 200 parts per million and about 2,000 parts per million by weight halogen, and at least one thermal hole generating selenium alloy photoconductive layer, said electrophotographic imaging member being free of any insulating charge retaining protective overcoating.

4,572,884

STILBENE DERIVATIVES AND ELECTROPHOTOGRAPHIC PHOTOCONDUCTOR COMPRISING ONE STILBENE DERIVATIVE

Masaomi Sasaki, Susono, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

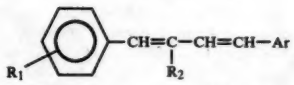
Filed Nov. 22, 1983, Ser. No. 554,422

Claims priority, application Japan, Nov. 25, 1982, 57-205437; Nov. 25, 1982, 57-205438; Nov. 26, 1982, 57-207251; Nov. 26, 1982, 57-207252

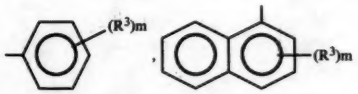
Int. Cl.⁴ G03G *5/06*

U.S. Cl. 430—72 **2 Claims**

1. An electrophotographic photoconductor comprising an electroconductive support material and a photosensitive layer comprising at least one stilbene derivative of the formula



wherein R^1 represents a lower alkyl group, an alkoxy group, an unsubstituted or substituted phenoxy group or a hydroxyl group, R^2 represents hydrogen, a lower alkyl group or an unsubstituted or substituted phenyl group; Ar represents



or a 9-anthryl group, R^3 represents hydrogen, an alkyl group, an alkoxy group, halogen or a substituted amino group represented by

in which R^4 and R^5 each represent an alkyl group, an unsubstituted or substituted aralkyl group, or an unsubstituted or substituted aryl group, and m is an integer of 0, 1, 2 or 3.

4,572,885

DEVELOPER COMPOSITION FOR DEVELOPING AN ELECTROSTATIC IMAGE

Keiji Sato; Takahira Kasuya; Goichi Yamakawa, and Tsuneo Wada, all of Hachioji, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Jul. 7, 1982, Ser. No. 395,963

Claims priority, application Japan, Jul. 13, 1981, 56-108144; Jul. 20, 1981, 56-112116

Int. Cl.⁴ G03G *9/16*

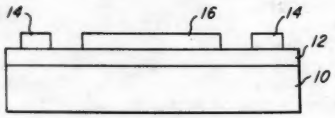
U.S. Cl. 430—99 **28 Claims**

1. A developer for developing an electrostatic image, which comprises a carrier comprising iron powder particles coated with a resin selected from the group consisting of a resin containing structural units of an α, β-unsaturated ethylenic monomer, an epoxy resin, a cellulose resin, a polyvinyl butyral resin, a styrene-butadiene resin and a fluorinated resin and a toner comprising a having a softening point of 60° to 180° C. polypropylene.

4,572,886
OPTICAL METHOD FOR INTEGRATED CIRCUIT BAR IDENTIFICATION

Lee R. Reid, Plano, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Nov. 3, 1983, Ser. No. 548,545
Int. Cl.[4] G03C 5/36; H01L 21/66
U.S. Cl. 430—152 5 Claims



1. A method for marking selected semiconductor devices on a semiconductor wafer to distinguish said devices in accordance with test results obtained on said devices, comprising the steps of:

forming an optically sensitive layer upon said semiconductor devices to be selectively marked; and

selectively exposing at least a portion of said layer associated with said devices selected in accordance with the test results to a source of radiation to alter the visual appearance of said layer in the irradiated portions.

4,572,887
RADIATION-POLYMERIZABLE MIXTURE WITH CROSSLINKABLE BINDER

Ulrich Geissler, Frankfurt, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

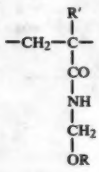
Filed Aug. 13, 1984, Ser. No. 640,139
Claims priority, application Fed. Rep. of Germany, Aug. 16, 1983, 3329443
Int. Cl.[4] G03C 1/68
U.S. Cl. 430—288 14 Claims

1. A radiation-polymerizable mixture, comprising:

(a) a compound which has at least two terminal ethylenically unsaturated groups and which forms a cross-linked polymer by means of addition chain polymerization initiated by free radicals,

(b) a polymeric binder in an amount sufficient to produce, when heated, said cross-linked polymer, and

(c) a radiation-activatable polymerization initiator in an amount sufficient to initiate polymerization, wherein said binder comprises a copolymer with units of the formula



wherein:

R′ denotes a hydrogen atom or a methyl group, and

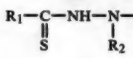
R denotes a hydrogen atom, a lower alkyl group, a lower acyl group, or a lower hydroxyalkyl group, said copolymer being present in an amount sufficient to provide a sufficient naumber of $ROCH_2$ groups for cross-linking.

4,572,888
PHOTOPOLYMERIZABLE COMPOSITION WITH ADHESION IMPROVING ADDITIVE

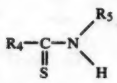
Minoru Maeda; Masayuki Iwasaki, and Fumiaki Shinozaki, all of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Dec. 20, 1983, Ser. No. 563,484
Claims priority, application Japan, Dec. 20, 1982, 57-223277; Mar. 10, 1983, 58-39399
Int. Cl.[4] G03C 1/74
U.S. Cl. 430—288 5 Claims

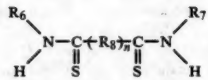
1. A photopolymerizable composition which comprises (1) a non-gaseous ethylenic unsaturated compound which has at least two ethylenic unsaturated groups and forms a polymer by the aid of a photopolymerization initiator, (2) a thermoplastic organic polymer binder, (3) a photopolymerization initiator which is activated by activating light, and (4) an adhesion improving additive with respect to a metal surface, the adhesion improving additive being a derivative of a thiohydrazide as represented by formula (I) or at least one derivative of a carbothio acid amide as represented by formula (II) or formula (III):


(I)

wherein R_1, R_2 and R_3 each represents a hydrogen atom, an alkyl group, an aryl group, a heterocyclic group, an acyl group, or an aralkyl group; and they may be the same or different from one another and they may form a ring


(II)

wherein R_4 and R_5 each represents a hydrogen atom, an alkyl group, an aryl group, a heterocyclic group, or an aralkyl group; and they may be the same or different from each other,


(III)

wherein R_6 and R_7 each represents the same group as defined for R_4 and R_5; R_8 represents an alkylene group, an arylene group or a heteroarylene group; and n denotes 0 or 1,

and wherein the amount of ingredient (1) is 10 to 500 parts by weight per 100 parts by weight of ingredient (2), the amount of ingredient (3) is 0.1 to 20 parts by weight per 100 parts by weight of ingredient (1), and the amount of ingredient (4) is 0.0005 to 5% by weight based on the weight of the photopolymerizable composition.

4,572,889
LITHOGRAPHIC PRINTING PLATE AND PROCESS FOR PRODUCTION THEREOF

Masanori Imai, and Hisao Kanzaki, both of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Dec. 20, 1984, Ser. No. 684,408
Claims priority, application Japan, Dec. 26, 1983, 58-251819
Int. Cl.[4] G03F 7/08
U.S. Cl. 430—302 31 Claims

1. In a process for producing a lithographic printing plate comprising imagewise exposing a presensitized lithographic printing plate precursor comprising a metal support to light, developing the precursor with a developing solution, and

subjecting the developed printing plate precursor to a burning-in treatment, the improvement comprising applying an aqueous solution containing at least one compound selected from the group consisting of malic acid and salts thereof onto the printing plate precursor after development but before the burning-in treatment.

4,572,890

PROCESS FOR THE PRODUCTION OF IMAGES

Jonathan W. Goodin, and Edward Irving, both of Cambridge, England, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed May 1, 1984, Ser. No. 605,952

Claims priority, application United Kingdom, May 11, 1983, 8312879; Jul. 15, 1983, 8319218

Int. Cl.⁴ G03C *5/00*

U.S. Cl. 430—325 **19 Claims**

1. A process for the production of an image comprising

(i) heating a layer, supported on a carrier, of a liquid composition consisting essentially of effective amounts of

(A) a compound containing at least one heat-polymerizable, ethylenically unsaturated group,

(B) a photopolymerizable material, and

(C) a thermally activated free radical initiator for polymerization of (A)

at a temperature at which the initiator (C) is activated,

thereby polymerizing the compound (A) through the heat-polymerizable ethylenically unsaturated group or groups thereof such that the layer solidifies but remains photopolymerizable, and subsequently

(ii) exposing the solidified layer to actinic radiation in a predetermined pattern such that exposed parts of the layer are photopolymerized and

(iii) removing those parts of the layer which have not become substantially photopolymerized by treatment with a solvent therefor.

4,572,891

METHOD FOR RECORDING MEDICAL DATA IN TWO MODES

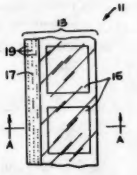
Jerome Drexler, Los Altos Hills, Calif., assignor to Drexler Technology Corporation, Mountain View, Calif.

Continuation-in-part of Ser. No. 443,596, Nov. 22, 1982, Pat. No. 4,503,135, which is a continuation-in-part of Ser. No. 238,832, Feb. 27, 1981, Pat. No. 4,360,728, and a continuation-in-part of Ser. No. 238,833, Feb. 27, 1981, abandoned. This application Dec. 6, 1984, Ser. No. 679,204

The portion of the term of this patent subsequent to Mar. 5, 2002, has been disclaimed.

Int. Cl.⁴ G03C *5/00, 3/00*

U.S. Cl. 430—346 **20 Claims**



1. A method for recording medical data comprising,

creating a medical picture on a picture storage medium,

disposing a laser recordable direct-read-after-write optical data storage lamella in side-by-side relationship with said medical picture on said picture storage medium, and

laser recording medical information related to said medical picture onto said optical data storage lamella.

4,572,892

DIRECT POSITIVE PHOTOGRAPHIC ELEMENTS WITH INCORPORATED MAXIMUM DENSITY ENHANCING ANTIFOGGANTS

Harry A. Hoyen, Webster, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 612,511, May 21, 1984, abandoned. This application Jun. 6, 1985, Ser. No. 741,928

Int. Cl.⁴ G03C *5/24*

U.S. Cl. 430—410 **11 Claims**

1. In a black and white direct positive photographic element intended for the formation of a viewable silver image and comprised of

a support,

one or more radiation sensitive emulsion layers containing internal latent image forming silver halide grains, and

a maximum density enhancing 1,2,3-triazole antifoggant,

further characterized in that said maximum density enhancing 1,2,3-triazole antifoggant is located in an undercoat between said emulsion layers and said support.

4,572,893

PHOTOGRAPHIC RESIN-COATED PAPER

Yasuzi Asao, Shizuoka, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Oct. 27, 1982, Ser. No. 437,105

Claims priority, application Japan, Oct. 29, 1981, 56-172025

The portion of the term of this patent subsequent to Jun. 21, 2001, has been disclaimed.

Int. Cl.⁴ G03C *1/76*

U.S. Cl. 430—532 **8 Claims**

1. A photographic paper comprising a paper sheet, a polyolefin resin layer coated over at least one surface of the paper sheet, and a photographic emulsion superposed on the resin layer, said polyolefin resin containing titanium dioxide powder coated with an alcohol having 2 to 6 carbon atoms and 2 and 4 hydroxyl groups in an amount of 0.01 to 10 percent by weight of the titanium dioxide powder, the titanium dioxide powder being contained in an amount of 1 to 40 percent by weight of polyolefin resin layer, and the surface of the polyolefin resin layer on which the photographic emulsion layer is superposed has been activated by corona discharge or flame.

4,572,894

PROCESS FOR SYNTHESIZING PEPTIDES OR PEPTIDE DERIVATIVES

Kazutomo Imahori, No. 2-25-23, Kakinokisaka, Meguro-ku, Tokyo; Hiroshi Nakajima, Kyoto; Tatsuo Iwasaki, Kyoto; Isao Tomioka, Kyoto, and Keiichi Yamamoto, Kyoto, all of Japan, assignors to Kazutomo Imahori; Rikagaku Kenkyusho and Unitika Ltd., all of, Japan

Filed Jan. 26, 1983, Ser. No. 461,307

Claims priority, application Japan, Jan. 26, 1982, 57-10336; May 27, 1982, 57-90425; May 27, 1982, 57-90426; Dec. 9, 1982, 57-216206

Int. Cl.⁴ C12P *21/00, 21/02;* C12N *9/00*

U.S. Cl. 435—68 **23 Claims**

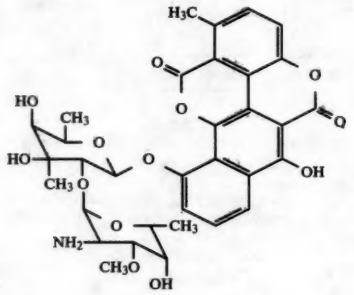
1. A process for synthesizing a peptide or a peptide derivative thereof comprising enzymatically bonding (a) a first amino acid to (b) a second amino acid, which may be the same or different than the first amino acid, or an amino acid derivative having a full amino group, with a condensing agent, wherein said condensing agent is aminoacyl-tRNA synthetase.

4,572,895
PROCESS FOR PREPARING AN ANTIBIOTIC COMPLEX BY CULTURING ACTINOMYCES STRAIN ATCC 39417

Masataka Konishi, Kawasaki; Kōko Sugawara, Wakō; Takeo Miyaki, Yokohama, and Hiroshi Kawaguchi, Tokyo, all of Japan, assignors to Bristol-Myers Company

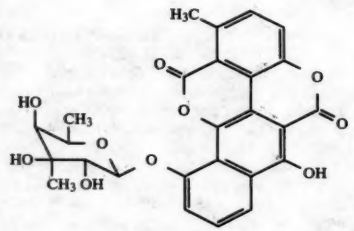
Division of Ser. No. 538,453, Oct. 3, 1983, Pat. No. 4,518,589, This application Feb. 19, 1985, Ser. No. 690,283
Int. Cl.[4] C12P *19/60*; C12N *1/20*; C12R *1/01*
U.S. Cl. 435—75 2 Claims

1. The process for the production of the antibiotic BBM-2478A having the formula



which comprises cultivating strain Actinomyces J907-21 (ATCC 39417) or a BBM-2478A-producing mutant thereof in an aqueous nutrient medium containing assimilable sources of carbon and nitrogen under submerged aerobic conditions until a substantial amount of BBM-2478A is produced by said organism in said culture medium and then recovering the BBM-2478A from the culture medium.

2. The process for the production of the antibiotic BBM-478B having the formula

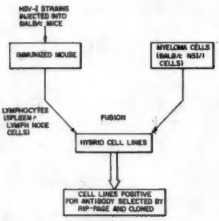


which comprises cultivating strain Actinomyces J907-21 (ATCC 39417) or a BBM-2478B-producing mutant thereof in an aqueous nutrient medium containing assimilable sources of carbon and nitrgen under submerged aerobic conditions until a substantial amount of BBM-2478B is produced by said organism in said culture medium and then recovering the BBM-2478B from the culture medium.

4,572,896
MONOCLONAL ANTIBODIES TO HERPES SIMPLEX VIRUS TYPE I POLYPEPTIDES

Berge Hampar, Middletown; Martin Zweig, Walkersville, and Stephen D. Showalter, Gaithersburg, all of Md., assignors to The United States of America as represented by the Department of Health and Human Services, Washington, D.C.

Continuation-in-part of Ser. No. 181,954, Aug. 27, 1980, Pat. No. 4,430,437. This application Nov. 22, 1982, Ser. No. 443,682
Int. Cl.[4] C12P *21/00*; C12N *15/00*; G01N *33/54*
U.S. Cl. 435—172.2 13 Claims


HSV-1 STRAINS INJECTED INTO BALB/c MICE
IMMUNIZED MOUSE
MYELOMA CELLS (BALB/c NS1/1 CELLS)
LYMPHOCYTES (SPLEEN + LYMPH NODE CELLS)
FUSION
HYBRID CELL LINES
CELL LINES POSITIVE FOR ANTIBODY SELECTED BY RIP-PAGE AND CLONED

1. A method for isolating monoclonal antibodies to specific HSV-1 proteins consisting essentially of fusing lymphoid cells from mice infected with HSV-I infected cell extracts to myeloma cells, selecting for the resulting hybrid cells in hypoxanthine-aminopterin-thymidine (HAT) medium, and analyzing the fluids from hybrid cell cultures by SDS-polyacrylamide gel electrophoresis of radioimmunoprecipitates (RIP-PAGE) formed with ^{35}S-methionine labelled HSV-1 infected cell extracts.

4,572,897
CARRIER FOR IMMOBILIZING ENZYMES

Shmuel Amotz, Malov; Susanne Rugh, Rungsted Kyst; Erik K. Markussen, Vaerlose, and Kurt Thomsen, Allerod, all of Denmark, assignors to Novo Industri A/S, Denmark

Filed Oct. 5, 1983, Ser. No. 539,305
Claims priority, application Denmark, Oct. 6, 1982, 4430/82
Int. Cl.[4] C12N *11/02, 11/10, 11/12, 11/08*
U.S. Cl. 435—177 17 Claims

5. Method for production of immobilized enzyme granules which comprises:

(a) admixing a water soluble binder dissolved or dispersed in an aqueous medium, and water insoluble inert filler particles, thereafter forming carrier granules from said mixture, then rendering the binder water insoluble and immobilizing an enzyme to the binder material at the surfaces of the carrier granules each of said filler particles having a particle size less than 1/5 of the least dimension of the granule in which it is contained.

4,572,898
THERMOPHILE ISOLATE HAVING THERMOSTABLE HYDROLYTIC ACTIVITY

Joseph G. Zeikus, Madison, Wis., assignor to Genentech, Inc., South San Francisco, Calif.

Filed Dec. 14, 1982, Ser. No. 449,716
Int. Cl.[4] C12N *9/24, 1/20*; C12R *1/145*; C12P *7/06*
U.S. Cl. 435—200 3 Claims

1. An enzyme product of *Clostridium thermosulfurogenes* displaying pectinolytic activity which loses no activity upon heating at a temperature of 60° C. for a period of 30 minutes.

4,572,899

AQUEOUS SOLUTION FOR SUSPENDING AND STORING CELLS, ESPECIALLY ERTHROCYTES

Wolfram H. Walker, Rödermark, and Karlheinz Gänshirt, Dreieich, both of Fed. Rep. of Germany, assignors to Biotest-Serum-Institut GmbH, Frankfurt, Fed. Rep. of Germany

Filed Jul. 6, 1983, Ser. No. 511,434

Claims priority, application Fed. Rep. of Germany, Jul. 7, 1982, 3225408

Int. Cl.[4] A01N *1/02*; A61K *35/14*

U.S. Cl. 436—18 9 Claims

1. Aqueous solution for suspending and storing cells, especially erythrocytes, and containing per liter 0.5–20 g of sodium chloride, 0.5–20 g of glucose or fructose, 0.05–1 g of adenine, guanosine in up to 1.5 g, 0–5 g of at least one phosphate and 1–20 g of sorbitol or xylitol.

4,572,900

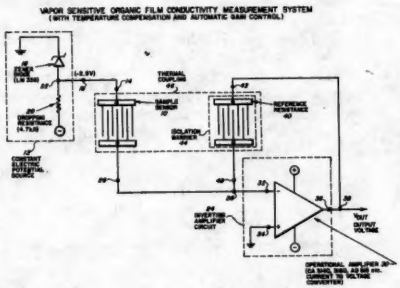
ORGANIC SEMICONDUCTOR VAPOR SENSING METHOD

Henry Wohltjen, Burke, Va., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 25, 1984, Ser. No. 603,874

Int. Cl.[4] G01N *27/16*

U.S. Cl. 436—151 36 Claims



1. A vapor detection apparatus having automatic temperature compensation comprising:

vapor sensitive variable electric resistance means for detecting the presence of vapor;

reference electrical resistance means having a temperature coefficient corresponding to said vapor sensitive resistance means for balancing thermal variation of said vapor sensitive resistance means;

coupling means thermally coupling said vapor sensitive resistance means and said reference resistance means;

electric potential means for generating a first current signal through one of said resistance means; and

electrical current-to-potential converting means for generating a second current signal through the other of said reistance means and developing an electric output potential inversely proportional to said first current signal combined with said second current signal.

34. A method of vapor detection having automatic temperature compensation comprising:

selecting a vapor sensitive variable electrical resistance means for detecting the presence of vapor;

selecting a reference electrical resistance means having a temperature coefficient corresponding to said vapor sensitive resistance means, isolation from vapor contact and thermally coupled to said vapor sensitive resistance means;

generating a first current signal through one of said resistance means with the application of a constant electric potential:

generating a second current signal through the other of said resistance means with the application of an electric output potential proportional to said first current signal combined with said second signal;

converting said first current signal combined with said second current signal into said electric output potential; and

measuring said electric potential output.

4,572,901

METHOD AND COMPOSITION FOR PROTEIN IMMOBILIZATION

Roberto L. Cerisani, Lafayette, and Jerry A. Peterson, Oakland, both of Calif., assignors to Children's Hospital Medical Center of Northern California, Oakland, Calif.

Filed Jun. 23, 1983, Ser. No. 507,430

Int. Cl.[4] G01N *33/544, 33/545, 1/48*; A61K *9/38*

U.S. Cl. 436—528 9 Claims

1. In a method for carrying out a diagnostic assay, wherein at least one of the analyte and reagent are a poly(amino acid), and the analyte is a member of a specific binding pair consisting of ligand and receptor, wherein one of said specific pair is bound to a solid surface, and the analyte is determined by the binding of analyte to its complementary member bound to the solid support, the improvement which comprises employing as a support a solid support coated with an alkylated poly(amino acid) of at least about 30,000 molecular weight, wherein said alkyl groups are from one to three carbon atoms, said alkylated poly(amino acid) being insoluble in water at 25° C. and soluble to at least 0.01 weight percent in an aqueous solution of a non-ionic detergent present in at least about 0.005 weight percent.

4,572,902

METHOD FOR PRODUCING CERAMIC SINTERED BODY OF A SI_3N_4-SIC SYSTEM

Taiji Matano; Haruyuki Ueno, and Kazushige Fukuda, all of Kitakyushu, Japan, assignors to Kurosaki Refractories Co., Ltd., Kitakyushi, Japan

Filed Feb. 7, 1985, Ser. No. 698,940

Claims priority, application Japan, Feb. 10, 1984, 59-23912

Int. Cl.[4] C04B *35/58*

U.S. Cl. 501—97 3 Claims

1. A method for producing ceramics having a closed pore structure from a sintered body of a Si_3N_4-SiC system which includes a process for heating ceramic sintered body in an atmosphere of a flowing gas mixture containing 0.1–80% in volume of chlorine and balance nitrogen gas at the temperature range of 500°–1500° C. after sintering whereby SiC is chemically reacted to produce silicon chloride which in turn is nitrided to form Si_3N_4 in the pores.

4,572,903

METHOD FOR REACTIVATING CATALYSTS USED FOR REMOVING NITROGEN OXIDES WITH STEAM

Masao Hino; Mitsuyasu Honda, and Toru Seto, all of Hiroshima, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 27, 1984, Ser. No. 644,534

Claims priority, application Japan, Aug. 25, 1983, 58-154207

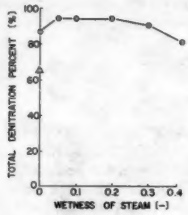
Int. Cl.[4] B01J *23/94, 23/92, 21/20*; B01D *53/36*

U.S. Cl. 502—55 1 Claim

1. A method for reactivating catalysts used for removing nitrogen oxides from exhaust gases which comprises the steps of:

jetting dry steam into a reactor which is charged with said catalysts deteriorated in performance, in order to remove

dust adhering to and accumulating on the surfaces of said catalysts;



spraying wet steam of 0.4 or less in wetness thereinto to elute and remove water-soluble poisonous materials accumulated inside said catalysts; and

drying said catalysts with said dry steam.

4,572,904

LEAD-TOLERANT CATALYST SYSTEM FOR TREATING EXHAUST GAS CONTAINING LEAD COMPOUNDS

Isik Onal, Arlington Heights, Ill., assignor to Signal Applied Technologies Inc., La Jolla, Calif.

Continuation-in-part of Ser. No. 536,416, Sep. 27, 1983, abandoned. This application Oct. 19, 1984, Ser. No. 662,733

Int. Cl.[4] B01J *21/04, 23/42, 23/44, 23/46*

U.S. Cl. 502—333 **5 Claims**

1. A lead resistant exhaust gas oxidation catalytic composite comprising a support material comprising a refractory inorganic oxide having deposited thereon a catalytic component selected from the group consisting of platinum, palladium, iridium, rhodium and mixtures thereof and having dispersed thereover a protective coating of zirconia.

4,572,905

SUBSTRATE FOR ANALYZING HYDROPHILIC SUBSTANCES OF LOW MOLECULAR WEIGHT

Teruo Sakagami, and Noriyuki Arakawa, both of Iwaki, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 456,846, Jan. 10, 1983, abandoned. This application May 8, 1984, Ser. No. 608,212

Claims priority, application Japan, Feb. 26, 1982, 57-29892

Int. Cl.[4] B01J *20/26*

U.S. Cl. 502—402 **17 Claims**

1. A porous substrate for analyzing hydrophilic substances of low molecular weight, having an exclusive molecular weight of less than 30,000, having a hydrophilic outer surface and a hydrophobic pore surface the substrate comprising a crosslinked copolymer having methylol groups and produced by subjecting a mixture of at least one monomer selected from styrene, alpha-methylstyrene and chloromethyl-styrenes and a cross-linking agent copolymerizable with the monomer to suspension copolymerization in an aqueous solution of 5 to 60 parts by weight of the water-soluble high polymeric substance per 100 parts by weight of the monomeric mixture of the monomer and the cross-linking agent in the presence of a pore regulator, and introducing methylol groups into the thus obtained cross-linked copolymer.

4,572,906

CHITOSAN BASED WOUND DRESSING MATERIALS

Brian G. Sparkes, Toronto, and Douglas G. Murray, Willowdale, both of Canada, assignors to Her Majesty the Queen in right of Canada, as represented by the Minister of National Defence of Her Majesty's Canadian Government, Ottawa, Canada

Filed Oct. 2, 1984, Ser. No. 656,851

Claims priority, application Canada, Nov. 21, 1983, 441609

Int. Cl.[4] A61F *13/00;* **A61K** *37/00, 31/70;* **C09D** *3/04*

U.S. Cl. 514—21 **16 Claims**

1. A method for making a wound dressing material, said material comprising a blend of gelatin and chitosan in a weight ratio of about 3:1 to 1:3, the method comprising:

(a) dissolving the chitosan in distilled water by adding lactic acid or hydrochloric acid in small portions over an extended time period to a stirred suspension of chitosan in water at about room temperature, the acid resulting in a pH in solution of about 2–5,

(b) adding the gelatin dissolved in dissolved water,

(c) mixing, and

(d) adding a basic solution to raise the pH of the mixture so formed to about 5.7 to 6.3.

4,572,907

HIGH CALORIC PRODUCT FOR I.V. ADMINISTRATION

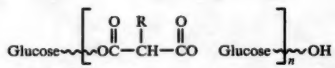
Alex M. Nadzan, Gurnee; André G. Pernet, Lake Bluff, both of Ill., and Stephen Hanessian, Beaconsfield, Canada, assignors to Abbott Laboratories, North Chicago, Ill.

Filed Mar. 22, 1984, Ser. No. 592,320

Int. Cl.[4] A61K *31/72*

U.S. Cl. 514—25 **26 Claims**

12. A composition for I.V. administration which is efficiently hydrolyzed, comprising an isotonic aqueous solution or emulsion of a nutritive amount of a compound of the formula



(I)

wherein n is an integer of 1 to 20 and R is hydrogen or an alkyl or alkenyl group of 1 to 20 carbon atoms, and wherein the glucose is attached at the 1-position, the 6-position, or the 1- and 6-positions.

4,572,908

DIHYDROPYRIDINES

Simon F. Campbell, Deal; Peter E. Cross, Canterbury; John K. Stubbs, and John E. Arrowsmith, both of Deal, all of England, assignors to Pfizer Inc., New York, N.Y.

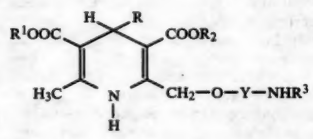
Filed Dec. 16, 1983, Ser. No. 562,482

Claims priority, application United Kingdom, Dec. 21, 1982, 8236347

Int. Cl.[4] C07D *401/12, 403/12;* **A61K** *31/44*

U.S. Cl. 514—340 **14 Claims**

1. A dihydropyridine compound of the formula



or a pharmaceutically acceptable acid addition salt thereof, wherein:

R is phenyl; phenyl substituted independently by one or two of nitro, halo, C_1–C_4 alkyl, C_1–C_4 alkoxy, hydroxy, trifluoromethyl or cyano; 1-naphthyl; or 2-naphthyl;

R^1 and R^2 are each independently C_1–C_4 alkyl or 2-methoxyethyl;

R^3 is a 5-membered heterocyclic azole containing three hetero atoms; or a substituted 5-membered heterocyclic azole containing three hetero atoms; with the proviso that R^3 is attached to the adjacent nitrogen atom by means of a bond between a carbon atom of R^3 and the adjacent nitrogen atom; and

Y is alkylene or alkylene substituted by 1 or 2 methyl groups wherein alkylene in each instance has 2–4 carbon atoms; wherein the substituted 5-membered heterocyclic is substituted by C_1–C_4 alkyl, C_1–C_4 alkoxy, halo, hydroxy, oxo, cyano, 3-(C_1–C_4 alkyl) ureido, phenyl, phenoxy, pyridyl, acetyl, (C_1–C_4 alkoxy) carbonyl, $—NR^4R^5$, $—SO_2NR^4R^5$ or $—CONR^4R^5$ where R^4 and R^5 are each independently hydrogen or C_1–C_4 alkyl.

4,572,909

2-(SECONDARY AMINOALKOXYMETHYL) DIHYDROPYRIDINE DERIVATIVES AS ANTI-ISCHAEMIC AND ANTIHYPERTENSIVE AGENTS

Simon F. Campbell, Deal; Peter E. Cross, Canterbury, and John K. Stubbs, Deal, all of England, assignors to Pfizer Inc., New York, N.Y.

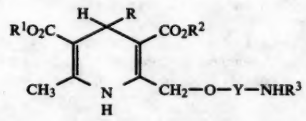
Continuation-in-part of Ser. No. 463,081, Feb. 2, 1983, abandoned. This application Feb. 3, 1984, Ser. No. 576,982

Claims priority, application United Kingdom, Mar. 11, 1982, 8207180

Int. Cl.[4] C07D *211/90*; A61K *31/455*

U.S. Cl. 514—356 **17 Claims**

1. A dihydropyridine compound of the formula



or a pharmaceutically acceptable acid addition salt thereof, wherein

Y is $—(CH_2)_2—$, $—(CH_2)_3—$, $—CH_2CH(CH_3)—$ or $—CH_2C(CH_3)_2—$;

R is aryl; R^1 and R^2 are each independently C_1–C_4 alkyl or 2-methoxyethyl; and R^3 is hydrogen, C_1–C_4 alkyl, 2-(C_1–C_4 alkoxy)ethyl, cyclopropylmethyl, benzyl, or $—(CH_2)_mCOR^4$ where m is 1, 2 or 3 and R^4 is hydroxy, C_1–C_4 alkoxy or $—NR^5R^6$ where R^5 and R^6 are each independently hydrogen or C_1–C_4 alkyl; wherein aryl is phenyl; phenyl substituted by one or two of nitro, halo, C_1–C_4 alkyl, C_1–C_4 alkoxy, hydroxy, trifluoromethyl or cyano; 1-naphthyl; or 2-naphthyl.

14. A pharmaceutical composition comprising an anti-ischaemic or antihypertensive effective amount of a compound according to claim 1 and a pharmaceutically acceptable diluent or carrier.

4,572,910

TRIAZOLO[1,5-C]PYRIMIDINES SUBSTITUTED BY NITROGEN-CONTAINING HETEROCYCLIC RINGS

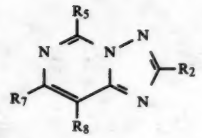
James J. Wade, Oakdale, Minn., assignor to Riker Laboratories, Inc., St. Paul, Minn.

Filed Mar. 3, 1983, Ser. No. 471,836

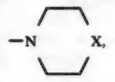
Int. Cl.[4] A61K *31/505, 31/535, 31/54*; C07D *471/04*

U.S. Cl. 514—222 **14 Claims**

1. A compound of the formula

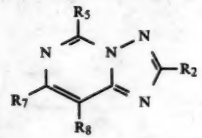


wherein R_2 is hydrogen or lower alkyl; at least one of R_5 and R_7 is

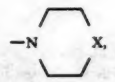


wherein each X is independently oxygen, sulfur, sulfinyl, sulfonyl, methylene, imido or lower N-alkylimido; one of R_5 and R_7 may also be hydrogen or lower alkyl; and R_8 is hydrogen, lower alkyl or phenyl; with the proviso that when R_5 only is a heterocyclic substituent, X is sulfinyl or sulfonyl; or a pharmaceutically acceptable salt thereof.

12. A method for obtaining bronchodilation in a mammal, comprising administering an effective amount of a compound to said mammal, said compound being of the formula



wherein R_2 is hydrogen or lower alkyl; at least one of R_5 and R_7 is



wherein each X is independently oxygen, sulfur, sulfinyl, sulfonyl, methylene, imido or lower N-alkylimido; one of R_5 and R_7 may also be hydrogen or lower alkyl; and R_8 is hydrogen, lower alkyl or phenyl; or a pharmaceutically acceptable salt thereof.

4,572,911

HEXAHYDROINDOLINZINE COMPOUNDS, PHARMACEUTICAL COMPOSITIONS AND METHODS AND INTERMEDIATES

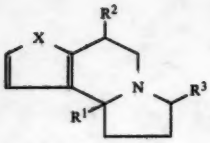
John R. Carson, Norristown, and Bruce E. Maryanoff, New Hope, both of Pa., assignors to McNeilab, Inc., Fort Washington, Pa.

Filed Aug. 2, 1984, Ser. No. 636,885

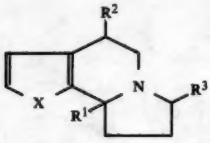
Int. Cl.[4] C07D *491/147, 471/14, 471/04, 31/44*

U.S. Cl. 514—291 **17 Claims**

1. A hexahydroindolizine derivative of the following formula (I) or (II):



(I)



(II)

wherein

R^1 represents hydrogen, alkyl, or phenyl;

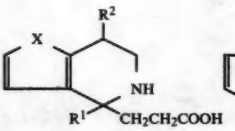
R^2 represents hydrogen, phenyl, a thiophene ring, a furan ring, a pyrrole ring, an N-alkylpyrrole ring or phenyl independently substituted with one or more of halogen and alkyl;

R^3 represents hydrogen, phenyl or phenyl indepenedently substituted with one or more of halogen, alkyl, alkoxy, or fluoroalkyl;

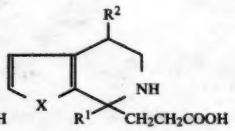
X represents a sulfur or an oxygen atom or an NR^4 group; and,

R^4 represents hydrogen, alkyl, phenyl, phenylalkyl, or phenylalkyl wherein the phenyl is independently substituted with one or more of halogen, alkyl, alkoxy, or fluoroalkyl, and the pharmaceutically acceptable acid addition salts thereof with the proviso that when X in formula I is sulfur, R^2 is not hydrogen.

15. A propanoic acid derivative of the following formula (V) or (VI):



(V)



(VI)

wherein

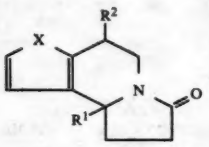
R^1 represents hydrogen, alkyl, or phenyl;

R^2 represents hydrogen, phenyl, a thiophene ring, a furan ring, a pyrrole ring, an N-alkylpyrrole ring or phenyl independently substituted with one or more of halogen and alkyl;

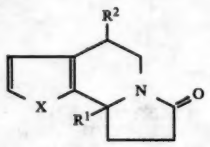
X represents a sulfur or an oxygen atom or an NR^4 group; and,

R^4 represents hydrogen, alkyl, phenyl, phenylalkyl, or phenylalkyl wherein the phenyl is independently substituted with one or more of halogen, alkyl, alkoxy, or fluoroalkyl.

16. A lactam compound of the following formula (VII) or (VIII):



(VII)



(VIII)

wherein

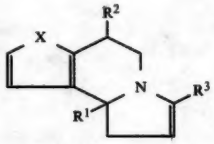
R^1 represents hydrogen, alkyl, or phenyl;

R^2 represents hydrogen, phenyl, a thiophene ring, a furan ring, a pyrrole ring, an N-alkylpyrrole ring or phenyl independently substituted with one or more of halogen and alkyl;

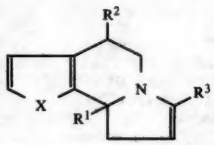
X represents a sulfur or an oxygen atom or an NR^4 group; and,

R^4 represents hydrogen, alkyl, phenyl, phenylalkyl, or phenylalkyl wherein the phenyl is independently substituted with one or more of halogen, alkyl, alkoxy or fluoroalkyl with the proviso that when X is sulfur and R^2 is hydrogen in formula (VII), R^1 is not phenyl or methyl.

17. A tetrahydroindolizine compound of the following formula (XIII) or (XIV):



(VIII)



(XIV)

wherein

R^1 represents hydrogen, alkyl, or phenyl;

R^2 represents hydrogen, phenyl, a thiophene ring, a furan ring, a pyrrole ring, an N-alkylpyrrole ring or phenyl independently substituted with one or more of halogen and alkyl;

R^3 represents phenyl or phenyl independently substituted with one or more of halogen, alkyl, alkoxy, or fluoroalkyl;

X represents a sulfur or an oxygen atom or an NR^4 group; and,

R^4 represents hydrogen, alkyl, phenyl, phenylaklyl, or phenylalkyl wherein the phenyl is independently substituted with one or more of halogen, alkyl, alkoxy, or fluoroalkyl.

4,572,912

THIAZOLIDINE DERIVATIVES, THEIR PREPARATION AND COMPOSITIONS CONTAINING THEM

Takao Yoshioka; Eiici Kitazawa; Tomoyuki Kurumada; Mitsuo Yamazaki, and Kazou Hasegawa, all of Hiromachi, Japan, assignors to Sankyo Company Limited, Tokyo, Japan

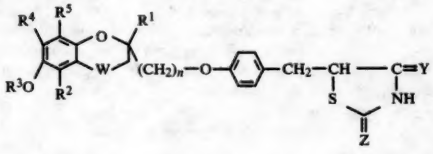
Filed Aug. 28, 1984, Ser. No. 644,996

Claims priority, application Japan, Aug. 30, 1983, 58-158375

Int. Cl.[4] **C07D** *417/12;* **A61K** *31/425*

U.S. Cl. 514—369 **39 Claims**

1. Compounds of formula (I):



in which:

R^1 and R^2 are the same or different and each represents hydrogen or a C_1–C_5 alkyl group;

R^3 represents hydrogen; C_1–C_6 aliphatic acyl; (C_5–C_7 cycloalkane)carbonyl; benzoyl, benzoyl substituted with one to three substituents selected from the group of C_1–C_4 alkyl, C_1–C_4 alkoxy, hydroxy, halogen, nitro, amino and di(C_1–C_4 alkyl)amino; naphthoyl; 4–7 membered heterocyclic acyl wherein heterocyclic moiety has O, S or N

hetero atoms; phenyl(C_2–C_3)aliphatic acyl; cinnamoyl; (C_1–C_6 alkoxy)carbonyl; or benzoyloxycarbonyl;

R^4 and R^5 are the same or different and each represents hydrogen, a C_1–C_5 alkyl group or a C_1–C_5 alkoxy group, or R^4 and R^5 together represent a C_1–C_4 alkylenedioxy group;

n is 1, 2 or 3;

W represents the —CH_2—, >CO or >CH—OR^6 group (in which R^6 represents any one of the atoms or groups defined for R^3 and may be the same as or different from R^3); and

Y and Z are the same or different and each represents the oxygen atom or the imino group; and pharmaceutically acceptable salts thereof.

4,572,913
USE OF 3-(ARYLMETHYLENEAMINO)-1-ARYL-2-PYRAZOLINES IN THE PROPHYLAXIS AND TREATMENT OF INFLAMMATION, PAIN, PYRESIS, AND ASTHMA

Frederick C. Copp, Beckenham; Albert G. Caldwell, West Wickham, and David Collard, Beckenham, all of England, assignors to Burroughs Wellcome Co., Research Triangle Park, N.C.

Filed Dec. 15, 1981, Ser. No. 331,009

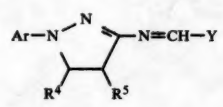
Claims priority, application United Kingdom, Dec. 23, 1980, 8041149; Mar. 18, 1981, 8108478

Int. Cl.⁴ A61K *31/415, 31/44, 31/47;* **C07D** *231/06*

U.S. Cl. 514—403 **17 Claims**

1. 3-Salicylideneamino-1-(3-trifluoromethylphenyl)-2-pyrazoline.

11. A method for prophylaxis or treatment of inflammation in a mammal in need thereof, including man, comprising the administration to said mammal of a non-toxic, effective anti-inflammatory amount of a compound of formula (I) or a pharmaceutically acceptable salt thereof:



(I)

wherein, Y is a monocyclic or bicyclic aromatic radical selected from phenyl, naphthyl, quinolyl, and pyridyl optionally substituted in any position of the ring by one or more substituent(s) selected from fluoro, chloro, bromo or iodo, nitro, carboxy, hydroxy, amino, monoalkyl substituted-amino, dialkyl substituted-amino, monohalo substituted-alkyl, dihalo substituted-alkyl, trihalo substituted-alkyl, alkyl, alkoxy, carboxyalkoxy, alkylsulphonyl, monohalo substituted-alkyl sulphonyl, dihalo substituted-alkyl sulphonyl and trihalo substituted-alkyl sulphonyl; R^4 and R^5 are each the same or different and are each selected from hydrogen, alkyl, or Y as defined above; and Ar is selected from Y as defined above with the proviso that Ar is other than unsubstituted phenyl.

4,572,914
INSECTICIDAL 4-SUBSTITUTED-3-CHLOROPHENYL-1-(FLUOROALKOXYPHENYLCARBAMOYL)PYRAZOLINES

Roelof van Hes, and Arnoldus C. Grosscurt, both of Weesp, Netherlands, assignors to Duphar International Research B.V., Weesp, Netherlands

Filed Jun. 27, 1980, Ser. No. 163,767

Claims priority, application Netherlands, Jul. 3, 1979, 7905154

Int. Cl.⁴ A01N *43/56;* **C07D** *231/06*

U.S. Cl. 514—403 **8 Claims**

1. 1-(4-trifluoromethoxyphenylcarbamoyl)-3-(4-chlorophenyl)-4-phenyl-2-pyrazoline.

4. An insecticidal composition comprising

an insecticidally effective amount of a pyrazoline compound selected from the group consisting of 1-(4-trifluoromethoxyphenylcarbamoyl)-3-(4-chlorophenyl)-4-phenyl-2-pyrazoline, 1-[4-(1,1,2,2-tetrafluoroethoxy)phenylcarbamoyl]-3-(4-chlorophenyl)-4-(3-cyanopropyl)-2-pyrazoline, and 1-(4-trifluoromethoxyphenylcarbamoyl)-3-(4-chlorophenyl)-4-(3-cyanopropyl)-2-pyrazoline and

a solid or liquid inert carrier.

4,572,915
CLEAR MICELLIZED SOLUTIONS OF FAT SOLUBLE ESSENTIAL NUTRIENTS

Michael J. Crooks, Chatswood, Australia, assignor to Biogian Laboratories and Biogian, Inc., both of Santa Ana, Calif.

Filed May 1, 1984, Ser. No. 605,797

Int. Cl.⁴ A61K *31/59, 31/20, 31/045, 31/355*

U.S. Cl. 514—458 **42 Claims**

1. A substantially clear micellized aqueous solution of one or more fat soluble essential nutrients selected from a group consisting of essential fatty acids, alpha-tocopherol, pharmaceutically acceptable esters of alpha-tocopherol having Vitamin E activity, retinol, pharmaceutically acceptable esters of retinol having Vitamin A activity, calciferol and pharmaceutically acceptable derivatives of calciferol having vitamin D activity, said micellized aqueous solution having been prepared by a process comprising the steps of:

mixing one or more of the fat soluble essential nutrients with an emulsifying agent comprising polyethoxylated castor oil, and with a water miscible pharmaceutically acceptable polyol to obtain a first non-aqueous phase in ratios of approximately 2 to 6 units of weight of emulsifying agent and approximately 1 to 2 units of weight of polyol are used for each unit of weight of the fat soluble essential nutrients;

slowly adding approximately 0.8 to 1.5 unit of weight for each unit of weight of said non-aqueous phase of a warm aqueous phase consisting essentially of water while stirring the non-aqueous phase, rate of addition of the warm aqueous phase to the non-aqueous phase being such that the admixture of the two phases is at least at 55° C. substantially during the entire step of addition, and

after adding the aqueous phase to the non-aqueous phase, cooling the resulting clear admixture to at least 35° C.

4,572,916
TABLETS

Michael G. Lindley, Finchampstead, and Steven Hathaway, Camberley, both of England, assignors to Tate & Lyle Public Limited Co., England

Continuation of Ser. No. 369,493, Apr. 19, 1982, abandoned, which is a continuation-in-part of Ser. No. 203,450, Nov. 3, 1980, abandoned. This application Nov. 21, 1983, Ser. No. 553,867

Claims priority, application United Kingdom, Nov. 7, 1979, 7938562; Jul. 3, 1980, 8021825

Int. Cl.⁴ A61K *47/00*

U.S. Cl. 514—777 **18 Claims**

1. In the method of making tablets consisting essentially of tableting by direct compression a dry mix containing 3 to 90% of at least one active ingredient, the improvement comprising employing as a direct tableting aid, 10–95% crystallized, non-granulated and non-compacted isomaltulose.

4,572,917
SILICONE WEAR BASE ELASTOMERIC FOAM

Daniel Graiver, Midland, and Robert E. Kalinowski, Auburn, both of Mich., assignors to Dow Corning Corporation, Midland, Mich.

Filed Oct. 26, 1984, Ser. No. 665,224

Int. Cl.⁴ C08J *9/30*

U.S. Cl. 521—68 **23 Claims**

1. A method of preparing silicone foam consisting essentially of

(A) combining, at atmospheric pressure, ingredients selected from the group consisting essentially of

(1) sufficient silicone emulsion to provide 100 parts by weight of dispersed silicone polymer, said silicone emulsion being present as an aqueous, oil-in-water emulsion that cures upon drying at ambient temperature to an elastomeric film, the emulsion comprising silicone polymer, surfactant, water, and optionally filler, curing agent, and thickener, the emulsion having a solids content of from 35 to 80 percent by weight, and

(2) from 5 to 50 parts by weight of inorganic fibers having a diameter of less than 25 micrometers and a length of less than 10 millimeters with the ratio of length to diameter of greater than 10:1 to form a mixture, the mixture being a stable emulsion able to form a stable froth in step (B), then

(B) dispersing air throughout the mixture to create a stable froth, at the same time dispersing the fibers throughout the froth, then

(C) removing the water from the stable froth, to yield an open-cell foam having the walls of the foam cells comprising a thin layer of silicone elastomer reinforced with fibers.

4,572,918

FOAMABLE POLYORGANOSILOXANE COMPOSITIONS

Chi-Long Lee, and James A. Rabe, both of Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.

Continuation-in-part of Ser. No. 708,188, Mar. 4, 1985, which is a division of Ser. No. 665,272, Oct. 26, 1984, Pat. No. 4,518,716. This application Aug. 19, 1985, Ser. No. 766,621

Int. Cl.[4] C08J *9/08, 9/10, 9/12*

U.S. Cl. 521—91 **20 Claims**

1. A foamable polyorganosiloxane composition exhibiting a viscosity of from 0.5 to 500 Pa.s at 25° C. in the absence of blowing agents, where said composition is stable during storage under anaerobic conditions and superatmospheric pressure, and in the presence of atmospheric pressure and oxygen yields a cured, closed cell polyorganosiloxane foam exhibiting a uniform distribution of cells no larger than about 4 mm., said composition comprising the product obtained by mixing in the absence of oxygen

(A) an oxygen curable elastomeric composition comprising (1) a mercapto organosiloxane polymer containing an average of more than two siloxane units per molecule having a mercaptoalkyl or mercaptoalkylene group bonded to silicon, the remaining siloxane units exhibiting the average formula $R_p^1SiO_{(4-p/2)}$, where each R^1 individually represents an alkyl radical containing from 1 to 4 carbon atoms, a phenyl radical, a 3,3,3-trifluoropropyl radical or an alkoxy radical containing from 1 to 4 carbon atoms, with the proviso that at least 20 mole percent of said siloxane units are dimethylsiloxane, said mercaptoalkylene radical is $-CH_2-CH(SH)-CH_2-CH_2-$, said mercaptoalkyl group contains from 1 to 4 carbon atoms and the value of p is from 1.5 to 2.5, and (2) a cobaltocene of the formula $(R^2C_5H_4)Co(C_5H_4R^3)$ in an amount sufficient to promote curing of (1) in the presence of oxygen, where R^2 and R^3 are individually selected from hydrogen and methyl;

(B) an amount of a foam stabilizer sufficient to stabilize said foam during the curing process, where (B) consists essentially of a resinous, benzene-soluble organosiloxane copolymer consisting essentially of $SiO_{4/2}$ units, silicon-bonded hydroxyl groups, $(CH_3)_3SiO_{\frac{1}{2}}$ units and fluorine-containing units selected from the group consisting of $R_aR'_bSiO_{(4-a-b)/2}$, $R''[Si(R')_bO_{(3-b)/2}]_2$ and mixtures thereof, where R is a monovalent organic radical containing at least four perfluorinated carbon atoms and is bonded to the silicon atom of said fluorine-containing units by a sequence of at least two methylene units or by an oxygen atom that is, in turn, bonded to a sequence of at least two methylene units, R' is an alkyl radical containing from 1 to 3 carbon atoms, R'' is a divalent organic radical containing at least four perfluorinated carbon atoms and is bonded to the silicon atom of said fluorine-containing units by a sequence of at least two methylene units or by an oxygen atom that is in turn bonded to a sequence of at least two methylene units, a is 1 or 2, b is 0, 1 or 2 and the sum of a and b is 3 or less, with the proviso that when R and R'' are bonded to silicon via an oxygen atom the organosiloxane copolymer optionally contains repeating units of the formula $GSiO_{3/2}$ where G represents the residue obtained by removal of the hydrogen atom from a hydroxyl group of a linear organic polymer containing an average of at least one terminal hydroxyl group per molecule and selected from the group consisting of polyethers, polyoxyalkylene glycols, homopolymers of ethylenically unsaturated alcohols and copolymers of ethylenically unsaturated alcohols with ethylenically unsaturated hydrocarbons; the molar ratio of all units other than hydroxyl and $SiO_{4/2}$ units to $SiO_{4/2}$ units is from 0.7:1 to 1.1:1, inclusive, and the concentration of said fluorine-containing units and any $GSiO_{3/2}$ units is sufficient to (a) impart a surface tension of less than 2.2×10^{-4} newtons per centimeter at 25° C. to a 10 percent by weight solution of (B) in a hydroxyl endblocked polydimethylsiloxane exhibiting a viscosity of 0.08 Pa.s at 25° C. and (b) require the addition of from 0 to 100 percent by weight of xylene to said 10 percent by weight solution to achieve optical clarity; and

(C) a blowing agent in an amount sufficient to convert said polyorganosiloxane composition to a foam under atmospheric pressure and at a temperature of 25° C.

4,572,919

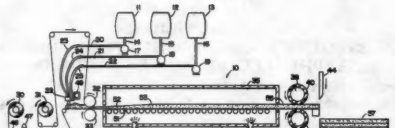
UNSATURATED POLYOXYALKYLENE ADDUCT/FUMARATE DIESTER REACTION PRODUCT FOR CELLULAR FOAM STABILIZATION

Michael E. Londrigan, Clearwater, Fla., assignor to Jim Walter Resources, Inc., Birmingham, Ala.

Division of Ser. No. 490,279, May 2, 1983, Pat. No. 4,529,745. This application Feb. 15, 1985, Ser. No. 702,995

Int. Cl.[4] C08G *18/14, 18/63*

U.S. Cl. 521—115 **24 Claims**



1. A composition comprising the product of a grafting reaction of

(a) an unsaturated polyoxyalkylene adduct comprising an alkylene oxide adduct of a member selected from the group consisting of unsaturated organic carboxylic acids and unsaturated hydroxyl containing triglycerides with

(b) at least one esterified unsaturated dibasic acid having the formula

$$T^1O_2C\text{-}(\text{-}C_uH_{2u-2}\text{-})\text{-}CO_2T^2$$

wherein u is 2 or 3, T^1 and T^2 are identical or different and represent a straight or branched, saturated or unsaturated hydrocarbon chain of 8 to 18 carbon atoms, and unsaturated diester reactant (b) includes an amount of fumarate diester effective to bring about grafting of greater than 75 percent by weight of unsaturated diester reactant (b) to the unsaturated polyoxyalkylene adduct, in the presence of an effective amount of a free-radical initiator.

13. A process for the preparation of a cellular foam stabilizer comprising grafting

(a) an unsaturated polyoxyalkylene adduct comprising an alkylene oxide adduct of a member selected from the group consisting of unsaturated organic carboxylic acids and unsaturated hydroxyl containing triglycerides with

(b) at least one esterified unsaturated dibasic acid having the formula

$$T^1O_2C\text{-}(\text{-}C_uH_{2u-2}\text{-})\text{-}CO_2T^2$$

wherein u is 2 or 3, T^1 and T^2 are identical or different and represent a straight or branched, saturated or unsaturated hydrocarbon chain of 8 to 18 carbon atoms, and unsaturated diester reactant (b) includes an amount of fumarate diester effective to bring about grafting of greater than 75 percent by weight of unsaturated diester reactant (b) to the unsaturated polyoxyalkylene adduct, in the presence of an effective amount of a free-radical initiator.

4,572,920

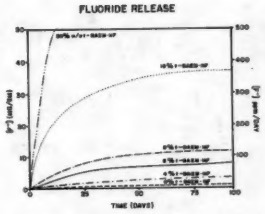
FLUORIDE INTERPOLYMERIC RESIN

Henry R. Rawls, New Orleans, and Barbara F. Zimmerman, Metairie, both of La., assignors to Research Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 461,026, Jan. 26, 1983, Pat. No. 4,515,910. This application Mar. 20, 1985, Ser. No. 700,847

Int. Cl.[4] A61K *7/18*; C08L *27/12*

U.S. Cl. 523—115 **31 Claims**



1. An acrylic, controlled-fluoride-releasing interpolymer comprising the reaction product of:

a. an anion-exchange-site bearing monomer carrying a fluoride ion in an amount sufficient to provide a caries-inhibiting amount of fluoride;

b. a copolymerizable acrylic monomer selected from the group consisting of bis-MA; bis-GMA; bis-EMA; bis-PMA; UEDMA; TUDMA, c-HaDMA; c-HeDMA;

c. a monomer which forms a cross-link in the resulting interpolymeric resin.

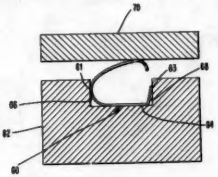
28. A method of preventing dental caries comprising impregnating a tooth with the interpolymer of claim **1**.

4,572,921

ELECTROMAGNETIC SHIELDING DEVICE

James P. May, Scranton, Pa., and Arthur R. Eppler, Clifton, N.J., assignors to Instrument Specialties Co., Inc., Delaware Water Gap, Pa.

Filed Jul. 30, 1984, Ser. No. 635,847
Int. Cl.[4] H05K 9/00
U.S. Cl. 174—35 GC 28 Claims



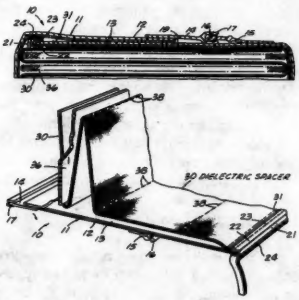
1. An electromagnetic shielding device comprising a continuous metallic strip defining a plurality of fingers and a base portion, each of the fingers extending over the base portion and being joined at one end to the base portion in a curved configuration and having a free end which extends in an inwardly curved configuration toward the base portion, said base portion defining a plurality of individual segments each having a free end with adjacent segments being connected by an associated finger.

4,572,922

SHIELDED RE-ENTERABLE JACKET WITH DIELECTRIC SPACER AND METHOD OF MAKING SAME

Walter A. Plummer, III, 14831 Foxcroft Rd., Tustin, Calif. 92680

Filed Mar. 8, 1984, Ser. No. 587,590
Int. Cl.[4] H01B 7/34; H01R 43/00
U.S. Cl. 174—36 19 Claims



1. A unitary shielded jacket for separable assembly about a plurality of insulated conductors to shield them from external flux fields and to maintain the rated impedance of the jacketed conductors generally constant from end-to-end thereof, said jacket comprising:

a main body of flexible material having an outer layer of non-conductive material coextensive with and laminated to an inner layer of conductive material;

a pair of separable interlocking seam members secured to the opposite lateral edge portions of said main body with one of said seam members being spaced substantially inwardly of and parallel to the adjacent lateral edge thereby to form a guard flap wide enough to underlie and bridge said seam members when interlocked;

a U-shaped strip of conductive material embracing and secured to the outer longitudinal edge of said guard flap;

a conductive grounding lead secured to the outer leg of said U-shaped strip; and

a dielectric spacer of non-conductive flexible netting material having one edge secured to the inner side of said guard flap and extending the full length of said jacket and sufficiently wide to provide overlapping encirclement of the interior of said jacket when snugly assembled about a group of insulated conductors; said dielectric spacer being constructed and arranged to provide a multiplicity of air cells adjacent said inner layer of conductive material which air cells have a thickness of about 35 mils or more.

17. That method of providing a jacket for snugly enclosing a multiplicity of insulated conductors in an electromagnetically shielded jacketing assembly in a manner to maintain the rated impedance of said insulated conductors enclosed thereby substantially constant from end-to-end of said conductors which comprises:

providing a continuous strip of flexible shielded jacketing having an outer layer of flexible elastomeric material and a coextensive inner layer of conductive shielding material in contact with one another;

securing flexible separable interlocking seam means to the opposite lateral edge portions of said strip of flexible elastomeric material including a first member secured lengthwise of one outer lateral edge thereof and a second member separably interlockable with said first member and secured lengthwise of the other outer lateral edge thereof along an area spaced inwardly of said other lateral edge thereby to provide a guard flap sufficiently wide to underlie and bridge said first and second seam members when interlocked with one another; and

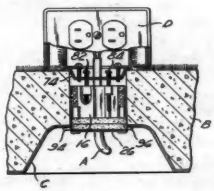
providing said shielded jacketing assembly with dielectric spacer means of non-conductive mesh material having a multiplicity of air cells extending therethrough and which said dielectric spacer means is sufficiently wide and sufficiently long for positioning between the length and width of conductors adapted to be enclosed by said jacketing assembly and between said conductors and said layer of conductive shielding material.

4,572,923

PRESS-FITTABLE CABLE-PASSAGE ENABLING DEVICE

Norman Castellani, Paramus, and Anthony Holland, Emerson, both of N.J., assignors to Raceway Components, Inc., Nutley, N.J.

Filed Nov. 1, 1983, Ser. No. 547,437
Int. Cl.[4] H02G 3/22
U.S. Cl. 174—48 30 Claims



1. A device for enabling cables to be pulled therethrough and through a concrete slab floor in which the device is adapted to be mounted, for connection of the cables from a raceway cell in an underfloor raceway cellular deck, to a service fitting for the cables, to which the device is adapted to be connected, to activate the service fitting, which device is adapted to be inserted into a hole to be formed through the floor after setting of the concrete in the floor, and into an aligned hole to be formed in the adjacent wall of the raceway cell, and to be engagable with the floor and automatically

positionable in engagable relation relative to the wall of the raceway cell, and further adapted to prevent heat transmission through the device or through the aligned holes to be formed in the floor and raceway cell wall, so as to restore the fire rating of the floor with the hole formed therein to substantially the fire rating of the floor without the hole formed therein, to enable the device to be fire-rated, comprising:

(a) a hollow housing, generally tubular shaped, the outside diameter of which is less than the diameter of the aligned holes to be formed in the floor and raceway cell wall, the hollow portion of which is adapted to enable the cables to be pulled therethrough, which includes first and second opposed ends;

(b) hollow means in the first end of the hollow housing for engaging the floor, the outside diameter of which is greater than the diameter of the hole to be formed in the floor, and the hollow portion of which is adapted to enable the cables to be pulled therethrough;

(c) toggle means in the second end of the hollow housing for engaging the wall of the raceway cell, adapted to enable insertion of the hollow housing into the aligned openings to be formed in the floor and wall of the raceway cell such that the second end may clear the raceway cell wall, and to thereupon automatically extend into engagable relation relative to the wall of the raceway cell; and

(d) means in the hollow housing for preventing transmission of heat through the device or through the aligned holes to be formed in the floor and wall of the raceway cell, so as to restore the fire rating of the floor with the hole formed therein to substantially the fire rating of the floor without the hole formed therein, adapted to enable the cables to be pulled therethrough.

4,572,924

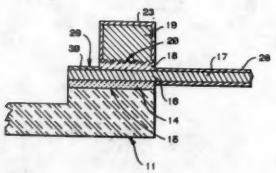
ELECTRONIC ENCLOSURES HAVING METAL PARTS

Wilbur T. Wakely, and Philip R. Scott, both of San Diego, Calif., assignors to Spectrum Ceramics, Inc., San Diego, Calif.

Filed May 18, 1983, Ser. No. 495,742

Int. Cl.⁴ H01L *23/10*

U.S. Cl. 174—52 FP **10 Claims**



1. A hermetically sealable enclosure for an electronic device comprising:

a. a base member having an area thereon adapted to hold an electronic device;

b. a first layer of solder glass on the upper surface of said base member on a margin around said area;

c. a lead frame positioned on and bonded to said base member by said solder glass;

d. a second layer of solder glass bonded on the upper surface of said lead frame; and

e. a metallic ring having a roughened bottom surface adapted to adhere to said second layer of solder glass, an upper surface of said metallic ring being adapted to have a cover for said package installed thereon.

4,572,925

PRINTED CIRCUIT BOARDS WITH SOLDERABLE PLATING FINISHES AND METHOD OF MAKING THE SAME

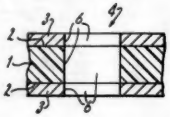
John A. Scarlett, Galashiels, Scotland, assignor to Standard Telephones and Cables Public Limited Company, London, England

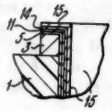
Filed Mar. 13, 1984, Ser. No. 589,025

Claims priority, application United Kingdom, Mar. 15, 1983, 8307142

Int. Cl.⁴ H05K *1/09, 3/06*

U.S. Cl. 174—68.5 **12 Claims**





1. A printed circuit board comprising:

an insulating substrate with at least one hole extending therethrough, the substrate forming a wall surface of the hole;

conductive areas provided on one or more surfaces of the insulating substrate, the conductive areas comprising a first copper layer on the substrate and on the hole wall surface, and a palladium-nickel alloy layer on the first copper layer, the palladium-nickel alloy layer during manufacture of the circuit board comprising an etch resist for the first copper layer; and

a second copper layer on the palladium-nickel alloy layer on at least one of said areas to enable a solder joint containing tin to be made at said at least one area, the palladium-nickel alloy at said at least one area serving to limit the diffusion of tin into the first copper layer from such solder joint, and the thickness of the second copper layer being determined in accordance with the volume of the solder joint to be made, said thickness being greater for a large volume solder joint than for a small volume solder joint to control the diffusion of said tin into the second copper layer.

8. A method of manufacturing a printed circuit board comprising the steps of:

selectively plating areas of a first copper layer-coated insulating substrate with a palladium-nickel alloy, the insulating substrate having at least one hole extending therethrough, the hole wall surface being coated by the first copper layer and said areas including the copper-coated hole wall surface;

employing the palladium-nickel alloy as an etch resist to protect said areas;

etching the first copper layer from the substrate except in said areas protected by said palladium-nickel alloy, or in other areas protected by another etch resistant layer; and

depositing a second copper layer on at least one of said palladium-nickel alloy plated areas to enable a solder joint containing tin to be made thereto, the palladium-nickel alloy at said at least one area serving to limit the diffusion of tin into the first copper layer from such solder joint, and wherein said depositing comprises controlling the thickness of the second copper layer in accordance with the volume of the solder joint to be made, said thickness being

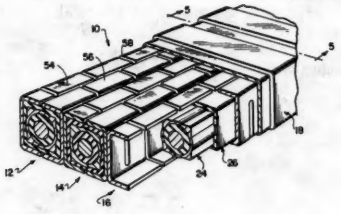
greater for a large volume solder joint than for a small volume solder joint to control the diffusion of said tin into the second copper layer.

4,572,926

ARMORED ELECTRICAL CABLE WITH LEAD SHEATH

Robert Ganssle, Huntington; Ernest G. Hoffman, Middlefield, and David H. Neuroth, Bethany, all of Conn., assignors to Harvey Hubbell Incorporated, Orange, Conn.

Filed Oct. 2, 1984, Ser. No. 656,982
Int. Cl.[4] H01B 7/18
U.S. Cl. 174—103 21 Claims



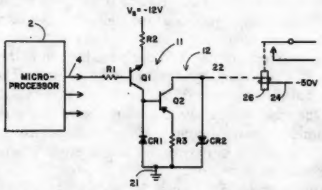
1. An electrical cable, the combination comprising:
an electrical conductor;
an insulation layer enclosing said conductor;
a barrier layer enclosing said insulation layer;
said barrier layer having a continuous cross section including an interior which is substantially circular and an exterior which includes four right angle corners oriented in a square array and four convex areas, each convex area interconnecting a pair of adjacent right angle corners;
a filler layer enclosing said barrier layer; and
a compression-resistant layer enclosing said filler layer and having a substantially square cross section.

4,572,927

CURRENT LIMITER FOR TELEPHONE OFFICE SIGNALLING

John M. Huft, Golden, Colo., assignor to GTE Communication Systems Corporation, Phoenix, Ariz.

Filed Mar. 9, 1983, Ser. No. 473,484
Int. Cl.[4] H03K 17/64; H04M 3/00
U.S. Cl. 179—16 AA 3 Claims



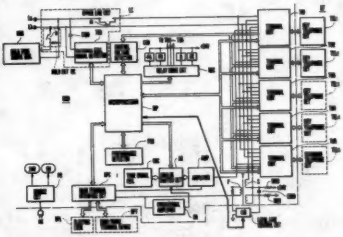
1. In a telephone ring-ground circuit that is controlled by a microprocessor, a current limiter comprising:
ring-ground switch means having one end thereof connected to a reference potential and selectively operative for completing a ring-ground circuit so as to supply a ground-start signal; said switch means comprising a first transistor having base, emitter and collector electrodes; said collector providing a ring-ground output connection when said first transistor is conducting; and a current limiting resistor interconnected between said emitter of said first transistor and said reference potential;
means for providing a voltage interface between the microprocessor and said switch means, and being responsive to a control signal from the microprocessor for operating said switch means; and
non-linear circuit means connected to said switch means so as to provide a reference voltage junction directly connected to said first transistor's base and an other junction that is connected to the reference potential, said non-linear circuit means being responsive to the voltage developed between said reference potential and said first transistor's base for limiting current passed by said switch means to no more than a predetermined current value;
said interface means comprising a second transistor having base, emitter and collector electrodes; said second transistors collector being connected to said reference voltage junction; a first level shifting resistor interconnected between a control output of the microprocessor and the base of said second transistor; and a second level shifting resistor interconnected between said second transistor's emitter and a supply voltage;
said non-linear circuit means comprising a light emitting diode oriented to establish a predetermined maximum value of voltage across the series combination of said current limiting resistor and a base-emitter junction diode of said first transistor when said first transistor is conducting; said light emitting diode having a current-voltage characteristic characterized by having a sharp knee at a low voltage that defines a small current change for large increases in voltage below the predetermined voltage and a large current change for small voltage changes above said predetermined voltage level.

4,572,928

KEY TELEPHONE SYSTEM

Tomio Nishimura, Chiba; Junzo Kikuchi, Kanagawa; Ryuzo Sugiura, Tokyo, and Toshiro Yoshida, Kanagawa, all of Japan, assignors to Tamura Electric Works, Ltd., Tokyo, Japan

Filed Nov. 8, 1983, Ser. No. 550,236
Claims priority, application Japan, Nov. 9, 1982, 57-196527; Nov. 19, 1982, 57-201987
Int. Cl.[4] H04Q 5/18
U.S. Cl. 179—99 A 14 Claims



1. In a key telephone system with a plurality of four-wire key telephone sets wherein a two-wire telephone set is connected to a main control device via a pair of speech lines so that intercom speech and office line speech are possible between the two-wire telephone set and other key telephone sets, the improvement wherein said main control device comprises a call signal generating circuit, first transfer switching means for transfer-connecting said speech lines between a pair of office speech lines and a pair of intercom speech lines, second transfer switching means for transfer-connecting said speech lines between said call signal generating circuit and said first transfer switching means, DC loop supervisory means for supervising a DC loop of said speech lines, and a control circuit inputted with an output of said DC loop supervisory means for controlling said first and second transfer switching means in accordance with the states of said office lines, whereby, under a normal state, said speech lines are connected to said intercom speech lines through said first and second transfer switching

means, at the time of arrival of an office line call signal said second transfer switching means is switched to send said call signal to said speech lines, thereafter said second transfer switching means is reset and said first transfer switching means is switched to the side of said office speech lines in accordance with the output of said loop supervisory means, which further comprises a substrate with a plurality of input terminals for an additional two-wire telephone set, said substrate having mounted thereon circuit elements other than said control circuit, one group of said terminals being connected to said control circuit, another group thereof being connected to said two-wire telephone set, and a remaining group also thereof being connected to said office speech lines and intercom speech lines, which still further comprises a substrate with a plurality of input and output terminals for an additional four-wire key telephone set and a signal transmitting and receiving circuit for transmitting control signals to said additional four-wire telephone set and receiving key control signals therefrom, said substrate having mounted thereon circuit elements other than said control circuit, one group of said terminals being connected to said control circuit, another group thereof being connected to said four-wire telephone set, a remaining group also thereof being connected to said office speech lines and intercom speech lines, said terminals of said substrate corresponding to said terminals of said substrate of said additional two-wire telephone set, and which further comprises means for judging whether the added substrate is of the two-wire type or four-wire type according to absence or presence of a sent back identification signal.

4,572,929

ASSEMBLY FOR THE TRANSMISSION OF ELECTRICAL ENERGY TO VEHICLES

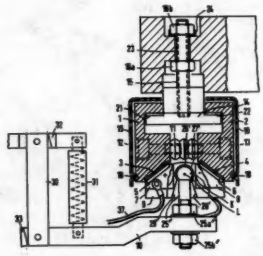
Christoph Nitschke, Erlangen; Helmut Wehrberger, Rottenbach, and Hermann Menhorn, Molln, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Jan. 27, 1983, Ser. No. 461,506

Claims priority, application Fed. Rep. of Germany, Jan. 29, 1982, 3202846; Nov. 26, 1982, 3243933

Int. Cl.⁴ B60L *5/39, 5/36;* **B60M** *1/30*

U.S. Cl. 191—29 R **13 Claims**



1. In an electrical transportation system wherein a vehicle is driven by electric power available from a pair of current carrying rails mounted on insulator supports, said vehicle having a current collector slidably engaging the rails for tapping current therefrom, the improvement wherein:

the rails are juxtaposed to one another and have respective first contact surfaces inclined at an angle toward one another and forming, in cross section, leg segments of an inverted V and the current collector comprises a sliding shoe with two second contact surfaces inclined toward one another at substantially said angle, said first contact surfaces engaging respective ones of said second contact surfaces during operation of the vehicle in the system, further comprising coupling means for movably mounting said shoe on said current collector to permit at least partial rotation of said shoe about a vertical axis and partial rotation about a pair of horizontal axes lying in the same horizontal plane at an angle with respect to one another, said coupling means having a centrally disposed support point and said second contact surfaces have centers of gravity, said second contact surfaces being disposed on said shoe such that an imaginary line connecting said centers of gravity passes at least approximately through said support point of the sliding shoe.

4,572,930

MULTIPLE SWITCH USING A ROTARY ACTUATOR

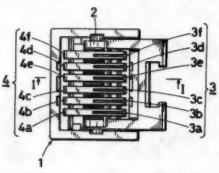
Toshio Kakuta, Higashiosaka, and Toshio Kikuchi, Nara, both of Japan, assignors to Hosiden Electronics Co., Ltd., Osaka, Japan

Filed Jun. 29, 1984, Ser. No. 626,099

Claims priority, application Japan, Jul. 18, 1983, 58-131564

Int. Cl.⁴ H01H *21/04*

U.S. Cl. 200—5 R **31 Claims**



1. A multiple switch using a rotary actuator comprising:

a body,

a stationary terminal block provided in the body, and in which a plurality of stationary terminals are arranged in parallel with one another,

a movable terminal block provided in the body, and in which a plurality of movable terminals are arranged to come in elastic contact with a respective one of said stationary terminals,

a rotary actuator supported on the body to be rotatable through a specified angle in a turning direction between an inoperative position and an operative position, said rotary actuator including a first projection group formed thereon in one location relative to the turning direction, said first projection group having at least one projection and a second projection group formed thereon in another location relative to the turning direction, said second projection group having at least one projection, each projection belonging to the first projection group separating a respective movable terminal from its corresponding stationary terminal by pressing the movable terminal, and each projection belonging to the second projection group bringing a respective movable terminal into elastic contact with its corresponding stationary terminal by releasing the pressure from the movable terminal in accordance with a turning movement of the rotary actuator between the inoperative position and the operative position. and

an elastic interposed between the body and the rotary actuator to rotatably urge the rotary actuator in the inoperative direction thereof.

4,572,931

ROTARY SWITCH

Tomio Shiraishi, and Shinobu Ikenoue, both of Miyagi, Japan, assignors to Alps Electric Co., Ltd., Japan

Filed Sep. 20, 1983, Ser. No. 534,062

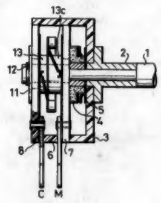
Claims priority, application Japan, Sep. 21, 1982, 57-141882[U]

Int. Cl.⁴ H01H *19/54, 21/76*

U.S. Cl. 200—11 DA **2 Claims**

2. A rotary switch having a plurality of outputs energized

according to a prearranged pattern during rotation of a shaft of said switch, said switch including first and second switch boards spaced apart and having respective contact portions formed on the facing surfaces thereof, the contact portions of said first board including an arcuate collector and a plurality of fixed contacts arranged in a predetermined pattern and said second board including a plurality of fixed contacts arranged in



a predetermined pattern, and means including a slider held rotatably between said switch boards and having two pairs of electrically-connected conductive arms with a respective pair of conductive arms extending towards the contact portions of each said board for connecting each of said fixed contacts electrically with said arcuate collector in a predetermined pattern as said slider is rotated.

4,572,932

ACTUATING MECHANISM

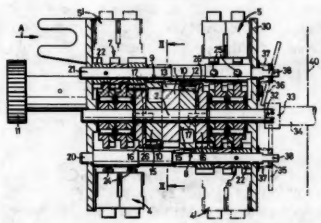
Peter G. Sanders, Frome, England, assignor to Rotork Controls Limited, England

Filed Mar. 28, 1983, Ser. No. 479,201

Claims priority, application United Kingdom, Apr. 23, 1982, 8211885

Int. Cl.[4] H01H *3/00*

U.S. Cl. 200—17 R **7 Claims**



1. In an actuating mechanism comprising a driving member, a driven shaft and a transmission means comprising a gear train through which the driven shaft is driven by the driving member through a certain angle of rotation after a predetermined number of revolutions of said driving member, and actuating means carried by said driven shaft and operative at a predetermined angular position of said driven shaft, the improvement comprising in combination an adjustment shaft which can be manually rotated to rotate the driven shaft through the transmission means, a clutch connected between the driving member and the transmission means to permit, by disengagement of the clutch, the adjustment shaft to rotate the driven shaft relatively to the driving member and so set the actuating means relatively to the driving member, a radial projection on the driven shaft in a fixed angular relationship to the actuating means thereon, and a removable abutment stop for engagement by said radial projection at a predetermined angular position of said radial projection with respect to the axis of the driven shaft to limit the angular displacement of said driven shaft by said adjustment shaft.

4,572,933

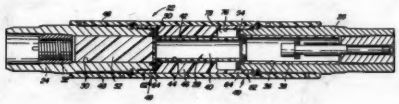
PRESSURE-OPERATED SWITCH FOR A HIGH-VOLTAGE INTERRUPTING MODULE

Roy T. Swanson, North Riverside, Ill., assignor to S&C Electric Company, Chicago, Ill.

Filed Aug. 22, 1983, Ser. No. 525,516

Int. Cl.[4] H01H *33/06*

U.S. Cl. 200—151 **16 Claims**



1. An improved switch for a high-voltage device; the switch being of the type in which ignition of a power cartridge generates high pressure ignition products which move an insulative piston, which is normally located in a first bore formed in a conductive member, away therefrom and into a passageway formed in an insulative liner, such movement of the piston moving a movable contact through the passageway and away from the conductive member to break an electrical interconnection between the conductive member and the movable contact, thereby opening the switch; the bore and the passageway being aligned; an insulative housing engageably surrounding, holding and fixing the relative positions of the conductive member and the liner; wherein the improvement comprises:

an interiorly relieved extension formed at and about one end of the liner, and

an exteriorly relieved region formed in and about the outside of the conductive member at one end thereof, the region being telescoped into and conformally engaging the inside of the extension so that the conductive member and the liner partially overlap along a tortuous interface.

4,572,934

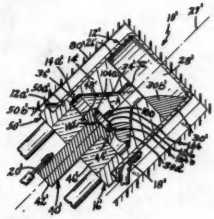
MERCURY SWITCH

Stephen P. Johnston, Detroit Lakes, Minn., assignor to S. J. Electro Systems, Inc., Detroit Lakes, Minn.

Continuation-in-part of Ser. No. 595,422, Mar. 30, 1984. This application Jul. 20, 1984, Ser. No. 632,722

Int. Cl.[4] H01H *29/22*

U.S. Cl. 200—222 **15 Claims**



1. A mercury switch; comprising:

(a) an outer metal housing having a closed end and an open end, said housing defining a bore and having a longitudinal axis;

(b) an electrically conductive baffle member coaxially positioned in said housing intermediate said closed and open ends of said housing, said baffle member defining an end facing said closed end of said housing and an end facing said open end of said housing, said baffle member defining a first bore, a second bore of increasing diameter in a direction toward said open end of said housing, and a third bore, said third bore being of a greater diameter than said first bore, said first, second, and third bores being contigu-

ous to define a continuous pathway from the closed end of said housing to the open end of said housing;

(c) an electrode assembly being at least partially inserted coaxially into the bore of said housing at said open end of said housing, said electrode assembly including:

(i) a solid electrode having a stem portion and a head portion, said head portion having an end surface facing said closed end of said housing and having a truncated conical configuration of decreasing diameter in a direction toward said end of said housing, said head portion including a collar portion coaxially surrounding said end surface and extending axially toward said closed end of said housing, said head portion extending from said third bore of said baffle member partially into said second bore of said baffle member, said head portion having a lesser diameter than said third bore of said baffle member and that portion of said second bore into which said head portion projects thereby defining a space between the head portion and the baffle;

(ii) a resilient, insulating member circumferentially positioned about said stem portion along an axial portion thereof, said insulating member abuting said head portion and having a greater diameter than said head portion; and

(iii) a weld ring member positioned circumferentially about said insulating member, said metal weld ring member being fixedly interconnected to said housing;

(d) a quantity of mercury; and

(e) a cavity positioned between the closed end of said housing and said end of said baffle member facing said closed end of said housing for holding said mercury when said mercury switch is in an off position, said first bore of said baffle member being in communication with said cavity.

4,572,935

COOKING APPARATUS HAVING AN INITIAL TEMPERATURE SETTING FUNCTION

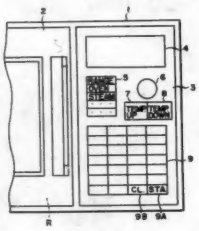
Hisao Karino, Nagoya, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Feb. 19, 1985, Ser. No. 702,724

Claims priority, application Japan, Feb. 21, 1984, 59-23764[U]; Jul. 12, 1984, 59-144675

Int. Cl.[4] H05B *6/68*

U.S. Cl. 219—10.55 B **10 Claims**



1. A cooking apparatus including an arrangement for setting an initial cooking temperature, comprising:

a housing including means for defining a heating chamber which can be operated in an over-cooking mode heated by a heater, and a temperature sensor for detecting the temperature inside said heating chamber;

a temperature-up setting key for increasing the temperature within said heating chamber in steps in response to each key depression thereof;

a temperature-down setting key for decreasing the temperature within said heating chamber in steps in response to each key depression thereof;

a timer control member for setting a cooking time for the cooking performed in said heating chamber;

first control means for receiving timing information when either said temperature-up setting key or said temperature-down setting key is first depressed and for controlling said heater on the basis of the detection values obtained from said sensor, in order to set the temperature within said heating chamber to a predetermined initial cooking temperature;

second control means for receiving depression information representative of the depression of said temperature-up setting key or temperature-down setting key after temperature within said heating chamber is set to the initial cooking temperature, and for controlling said heater on the basic of the detection value obtained from said sensor in order to set a cooking temperature corresponding to daid depression information; and

third control means for receiving the timing information set by said timer control member and controlling an operation time of said first or second controlling means.

4,572,936

SUBMERGED ARC WELDING PROCESS

Erhard Scholz, Eisenberg, Fed. Rep. of Germany; Edmund Heimann, Dietlikon, and Hans Baach, Niederglatt, both of Switzerland, assignors to Schweissindustrie Oerlikon Buhrle AG, Switzerland

Filed Feb. 21, 1984, Ser. No. 581,717

Claims priority, application European Pat. Off., Feb. 19, 1983, 83101612.6

Int. Cl.[4] B23K *9/18*

U.S. Cl. 219—73.2 **20 Claims**

1. A process for submerged arc welding, comprising the steps of:

providing granular flux in an area to be welded;

electrically coupling a plurality of welding wires to a source of electrical energy, at least one of the welding wires being an over-microalloyed wire, the remaining welding wires being of the group consisting of unalloyed and low-alloyed solid wires; and

supplying electrical energy to the welding wires simultaneously.

4,572,937

METHOD OF ELECTRICAL RESISTANCE ROLL SEAM WELDING WITH ONLY ONE ELECTRODE WIRE, MACHINE FOR PERFORMING THE PROCESS AND USE OF THE PROCESS

Paul Opprecht, Bergdietikon, Switzerland, and Wolfgang Weil, Heitersheim, Fed. Rep. of Germany, assignors to Soudronic AG, Bergdietikon, Switzerland

Filed Sep. 18, 1984, Ser. No. 651,812

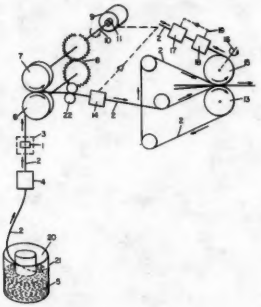
Claims priority, application Switzerland, Sep. 20, 1983, 5117/83

Int. Cl.[4] B23K *11/06*

U.S. Cl. 219—83 **28 Claims**

1. A method for electrically resistance roll seam welding which method comprises: providing only one electrode wire which is drawn from a wire supply and which moves into a resistance roll seam welding machine first over a first and then over a second of two electrode carrying rolls pressable against one another, and then welding workpieces fed between said electrode carrying rolls, the strength of which wire for the purpose of preventing the formation of wire loops between the two electrode carrying rolls before its entry into the first electrode carrying roll being increased by cold forming and its wire cross section before its entry into the first electrode carrying roll being reduced in cross sectional area and being trans-

formed from an essentially circular shape to a flat cross sectional shape with a width greater than the diameter of the round wire and a height less than the diameter of the round wire, characterized in that the cold forming is carried out in several steps such that before the entry of the wire into the first electrode carrying roll the wire is cold formed in a first forming stage by drawing and thereafter is cold formed in a second forming stage by rolling and that the electrode wire in the first forming stage is uniformly deformed over its entire cross section and whereby an essentially circular cross sectional shape is maintained during the cold forming in the first forming stage and in this first forming stage only the wire diameter is reduced and that this reduction in diameter is such that the predominant portion of the strength difference between the wire strength at the elastic limit after the second forming stage and the wire strength of annealed wire at the elastic limit is due to the strength difference between the wire strength at the elastic limit after the first forming stage and the wire strength of annealed wire at the elastic limit, and so that in the first forming stage an essentially uniform deformation of the electrode wire over the entire cross section occurs, and the cross sectional shape of the electrode wire is first transformed to the said flat cross sectional shape in said second forming stage and the electrode wire thereby being at least so far flattened that the widening of the electrode wire resulting from the flattening in the second forming stage is percentagewise larger than the percentage lengthening of the electrode wire resulting from the rolling in the second forming stage.



21. A resistance roll seam welding machine comprising first and second electrode carrying rolls pressable toward one another and over which rolls an electrode wire runs in sequence as the electrodes, and cold forming means for increasing the wire strength and reducing the wire cross sectional surface as well as for converting the wire cross sectional shape from an essentially round one into a flat cross sectional shape before the entry of the electrode wire onto the first electrode carrying rolls, characterized by rolling means (**6, 7, 8, 9, 10, 11**) with rolls (**6, 7**) driven by a motor (**9**) for cold forming in the second forming stage.

4,572,938

PROCESS FOR UNITING SLEEVE MEMBERS BY BRAZING

John M. Driggers, Penn Hills; Thomas J. Saska, Lower Burrell, and Arnold S. Kitzes, Pittsburgh, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jan. 16, 1984, Ser. No. 571,215

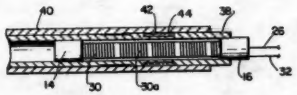
Int. Cl.⁴ B23K *1/02, 1/04*

U.S. Cl. 219—85 BM **6 Claims**

1. A process for uniting an assembly of a sleeve member and a tube, wherein the sleeve member is snugly inserted in the tube, with the outer surface of said sleeve member confronting and engaging the overlying surface of said tube, comprising:

interposing a brazing member intermediate said confronting surfaces, then

inserting in the bore of said sleeve at the location where the brazing is to occur an electrical resistance heating unit comprising an insulating, refractory, generally cylindrical elongate boron nitride mandrel that is formed with a lengthwise-extending bore and with enlarged diameter shoulder means at each of its ends respectively, and formed with helical recesses in its surface intermediate said shoulder means, a bare platinum-rhodium alloy wire disposed in said helical recesses and wound in the form of a generally helical coil having groups of windings in which the adjacent windings within each group of windings are substantially uniformly spaced from each other



and said groups of windings are also spaced from each other lengthwise of said mandrel for providing electrical resistance heating, a pair of bare electrical lead members operatively connected to opposite ends of said wire respectively and electrically insulated from each other by interposed parts of said mandrel, one of said lead members being disposed in and extending through said bore, each of said shoulder means being formed with an aperture for the passage therethrough of one of said lead members, respectively, and each of said lead members extending through one of said apertures respectively, for electrical connection to the opposite ends of said wire, respectively, and then

energizing said unit to heat the assembly to a temperature of at least 1000° C. to accomplish brazing.

4,572,939

BRAZING TECHNIQUE

Donald G. Harast, Idaho Falls, Id., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jan. 27, 1984, Ser. No. 574,504

Int. Cl.⁴ B23K *1/20*

U.S. Cl. 219—85 M **10 Claims**

1. A method of brazing components comprising the steps of:

sand blasting the components with particles of a brazing material to clean the surfaces of the components and to embed brazing material in the surfaces;

applying the brazing material to the components' surfaces; and

heating the brazing material to form a brazement between the components.

4,572,940

WELDING HEAD FOR RESISTANCE-WELDING

Hendricus C. P. Tijs, Mierlo, Netherlands, assignor to Weld-Equip b.v., Helmond, Netherlands

Filed Nov. 29, 1984, Ser. No. 676,285

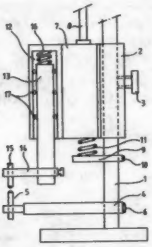
Claims priority, application Netherlands, Dec. 5, 1983, 8304167

Int. Cl.⁴ B23K *11/30*

U.S. Cl. 219—86.25 **12 Claims**

12. A resistance welding device for spot welding comprising first and second electrodes, a frame having said first electrode fixed thereto, a carrier member mounted on the frame and supporting an element, the second electrode being fixed to the element, the carrier member being slidable on the frame such that the first and second electrodes can be brought together, the element being spring biased to the carrier whereby the second electrode is constantly urged toward the first electrode

whereby the first and second electrodes are able to maintain a constant pressure against a workpiece during welding independent of thermal expansion and contraction of the workpiece, the element having a lower mass than said carrier.



4,572,941

METHOD OF AND INSTALLATION FOR SPOT-WELDING BY LASER BEAM

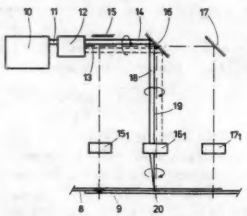
Mario Sciaky, Paris; Roland Cazes, St Maur, and Georges Sayegh, Paris, all of France, assignors to Sciaky, S.A., Vitry, France

Filed Jun. 26, 1984, Ser. No. 624,654

Claims priority, application France, Jun. 27, 1983, 83 10602

Int. Cl.[4] B23K *26/00*

U.S. Cl. 219—121 LD **2 Claims**



1. A method of spot-welding by laser beam, comprising generating a laser beam, rotating said beam about an axis parallel to its longitudinal axis, directing said rotated beam onto a static focusing means and directing the point of focus of said rotated beam by said static focusing means onto the objects to be welded.

4,572,942

GAS-METAL-ARC WELDING PROCESS

John G. Church, 7405 Kimbel St., Mississauga, Canada (L4T 3M6)

Continuation-in-part of Ser. No. 404,722, Aug. 3, 1982, Pat. No. 4,463,243, and a continuation-in-part of Ser. No. 349,141, Feb. 16, 1982, Pat. No. 4,464,560, said Ser. No. 404,722, is a continuation-in-part of Ser. No. 235,220, Feb. 17, 1981, abandoned. This application Jul. 24, 1984, Ser. No. 633,837

Int. Cl.[4] B23K *9/16, 9/00*

U.S. Cl. 219—137.420 **2 Claims**

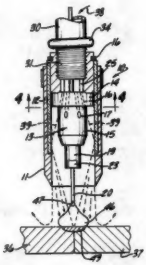
1. A gas-metal-arc welding process of the type using a consumable wire electrode continuously advanced axially longitudinally towards the weld deposit, with the electrode end spaced from the weld deposit forming an arc gap therebetween, comprising the steps of:

using a welding gun having a tubular nozzle surrounding, but radially spaced from, the electrode, said nozzle having a substantial cylindrical inner wall surface;

surrounding the electrode end and the gap with a flow of gas which is centered upon the electrode axis and which is directed towards the weld deposit, with the gas formed of a mixture of major proportions of argon and helium and minor proportions of carbon dioxide and of oxygen;

forming said gas flow by flowing a number of separate gas streams from passageways arranged within the nozzle around the electrode axis and spaced radially outward therefrom at substantially equal distances, with the exits of said passages arranged at a downstream diverging acute angle relative to the electrode axes;

impinging the separate streams upon the inner tubular wall surface of the nozzle so that the first portions of the streams are redirected by said wall surface to converge and focus radially inwardly at an acute angle towards a spot on the electrode axes in the gap near the weld pool, while second portions of each of the streams are redirected by said wall surface into a substantially cylindrical, annular column of flowing gas parallel to the electrode



axis and surrounding said converging first stream portions;

passing electrical current of sufficient power through the electrode to produce a welding arc in the gap;

the gas mixture producing a relatively stable, generally dome-shaped plasma formation in the gap;

steadily centering the plasma formation concentrically about the electrode axis by impinging said converging first stream portions of the gas flow against the plasma formation for applying a substantially steady, axially inwardly directed pressure upon the plasma formation aimed towards said spot;

and adjusting the electrode end gap so that the converging stream portions focus substantially towards the spot where the arc axis and weld deposit intersect;

whereby the energy of the arc and the plasma combine together and are concentrated to produce an increased intensity heat zone in the gap.

4,572,943

ELECTRICAL STEAM GENERATOR FOR INTERMITTENT OPERATION

Carl-Erik Högfeldt, deceased, late of Stockholm, Sweden (by Birgitta Högfeldt, administrator), assignor to Acela Pump AB, Stockholm, Sweden

PCT No. PCT/SE83/00059, § 371 Date Oct. 19, 1983, § 102(e) Date Oct. 19, 1983, PCT Pub. No. WO83/02992, PCT Pub. Date Sep. 1, 1983

PCT Filed Feb. 21, 1983, Ser. No. 552,125

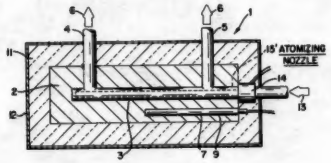
Claims priority, application Sweden, Feb. 22, 1982, 8201103

Int. Cl.[4] F22B *27/16, 1/28;* H05B *3/00*

U.S. Cl. 219—273 **3 Claims**

1. A steam generator intended for intermittent operation, consisting of a body (1), in which a water conducting passageway (3) and hollow spaces (8,9,10) and intermittently energizable electric resistance elements (7) in said hollow spaces are located, which body (1) is cylindrical and homogenous with

said passageway (3) axially and symmetrically positioned therein, from which passageway at least one radial outlet passageway (4,5) extends out of the body (1), characterized in that the body (1) externally is provided with a heat insulating material (11), the thickness of which is about the same magnitude as the radius of said body (1), which material is enclosed in a casing (12) made of a material, at least the inner surface of which is reflective, said insulating material and said casing together being capable of maintaining said body at a standby temperature of at least 70° C. when said resistance elements are deenergized between intermittent periods of steam generation,



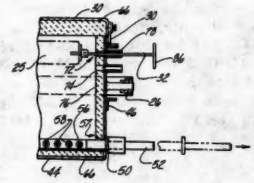
said resistance elements being capable when reenergized of heating said body to a steam generating temperature from said standby temperature in about 30 seconds, and in that an atomizing nozzle is provided for introducing water into said water conducting passageway consisting of a pipe located in the water conducting passageway (3) along at least the greater part of the length of the water conducting passageway (3) and radially spaced from the walls of the water conducting passageway (3), said pipe being provided with a plurality of small apertures distributed along the entire length of said pipe for effecting a uniform spray of atomized water against substantially all of the water conducting passageway walls.

4,572,944

ADJUSTABLE WELDING FURNACE

Thomas B. Ballard, 25550 Mulberry, Southfield, Mich. 48034

Continuation of Ser. No. 313,421, Oct. 21, 1981, Pat. No. 4,456,819. This application Feb. 17, 1984, Ser. No. 581,026
Int. Cl.⁴ F27D *11/00*
U.S. Cl. 219—391 **9 Claims**



1. A welding furnace comprising:

a base;

a furnace housing including substantially continuous walls defining a hollow substantially enclosed interior space for receipt of a workpiece to be welded and including an opening therein through which access may be gained to said workpiece within said housing interior;

means for mounting said furnace housing on said base for pivotal movement about a first axis which extends through said housing walls and through said housing interior and about a second axis which extends through said housing walls and through said housing interior and is disposed substantially perpendicular to said first axis;

means within said housing interior mounting said workpiece for movement within said housing interior relative to said housing;

control means disposed outside of said housing for selectively manually moving said workpiece mounting means within said housing interior to selectively move said workpiece within said housing interior relative to said housing; and

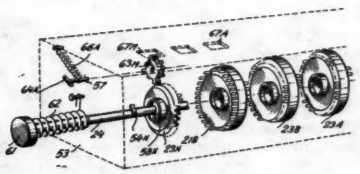
means within said housing interior for heating said housing interior and thereby said workpiece disposed within said housing interior.

4,572,945

RESET MECHANISM

Julio J. Bianchi, Buenos Aires, Argentina, assignor to General Electric Company, Somersworth, N.H.

Filed Nov. 27, 1984, Ser. No. 675,281
Claims priority, application Brazil, Nov. 29, 1983, 8306566
Int. Cl.⁴ G06C *15/42*
U.S. Cl. 235—144 SP **8 Claims**



1. A reset mechanism for a cyclometer register of a type having a plurality of cyclometer drums on a drum shaft, comprising:

resilient means for urging said drum shaft into a first axial position;

means for permitting manually displacing said drum shaft into a second axial position against an urging of said resilient means;

at least two teeth on said drum shaft;

an abutment on at least two of said cyclometer drums;

said teeth and said abutments being mutually positioned to permit abutment therebetween during rotation of said drum shaft when said drum shaft is manually displaced into said second axial position, whereby manual resetting of said cyclometer register is enabled;

said teeth and said abutments being further mutually positioned to avoid abutment therebetween when said drum shaft is in said first axial position whereby normal operation of said cyclometer register is enabled without a retarding friction being applied by said reset mechanism;

at least one carry pinion between first and second of said cyclometer drums;

a pinion shaft upon which said at least one carry pinion is rotatably disposed;

second resilient means for urging said carry pinion into engagement with said first and second cyclometer drums;

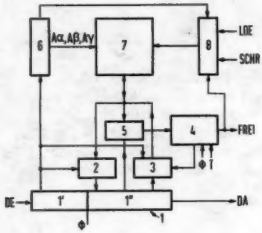
said second resilient means including guide means for permitting said at least one carry pinion to displace out of engagement with said first and second cyclometer drums during said rotation; and

means for locking said at least one carry pinion in a predetermined angular position while it is out of engagement with said first and second cyclometer drums whereby a resumption of engagement between said at least one carry pinion and said first and second cyclometer drums at the end of said rotation of said drum shaft is enabled.

4,572,946
CREDIT CARD CIRCUIT ARRANGEMENT WITH A MEMORY AND AN ACCESS CONTROL UNIT

Hartmut Schrenk, Haar, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed May 14, 1984, Ser. No. 609,783
Claims priority, application Fed. Rep. of Germany, May 18, 1983, 3318101
Int. Cl.[4] G06K 5/00
U.S. Cl. 235—380 11 Claims

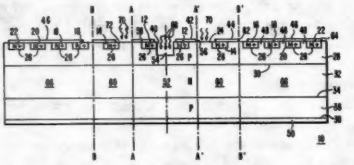


1. Monolithically integrable circuit arrangement consisting of a memory with non-volatile electrically writable and erasable memory cells, an addressing circuit for reading, writing and erasing memory, and of a control unit which makes the access to the memory dependent on a validation operation with data comparison between stored reference data and code data entered from the outside, wherein the control unit, consisting of at least one comparator (57) for delivering a comparison signal (DOK), of a write control unit (3) for alternatively writing on a first or second operating data region which can be selected via an addressing unit depending on the comparison signal in such a manner that in the event of equality of the data, the first, and in the event of inequality of the data, the second operating data region is addressed, and having an erase control unit (9) for erasing the operating data regions, depending on the preceding execution of a write operation in the first operating data region.

4,572,947
TRIGGERING METHOD FOR LIGHT TRIGGERED THYRISTORS

Yu C. Kao, Pittsburgh, and Scott G. Leslie, Penn Hills, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed May 29, 1984, Ser. No. 615,019
Int. Cl.[4] H01L 11/14; H01J 39/12
U.S. Cl. 250—211 J 6 Claims

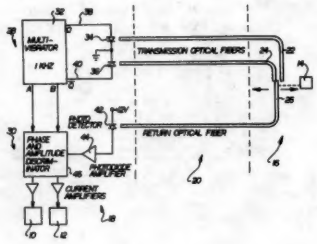


1. A method for triggering a light fired thyristor, said light fired thyristor having a photocathode area, an amplifying gate area and a main cathode area, said photocathode area having walls forming an optical well therein, said method comprising exciting carriers in at least the amplifying gate area with light energy, of a predetermined power level, from a first light source, said light energy from said first light source being incapable of triggering the light fired thyristor and thereafter triggering the light fired thyristor by directing light energy from a second light source at at least the optical well.

4,572,948
POSITION INDICATOR EMPLOYING LIGHT GUIDES

Robert E. Brooks, Manhattan Beach, Calif., assignor to TRW Inc., Cleveland, Ohio

Filed Jul. 15, 1983, Ser. No. 513,823
Int. Cl.[4] H01J 5/16
U.S. Cl. 250—227 13 Claims

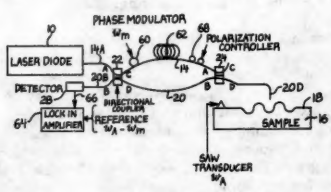


1. Apparatus for use with a movable member, comprising:
first, second and third light guide means,
means for introducing a first cyclically varying light signal into said first light guide means and a second cyclically varying light signal into said second light guide means, said cyclical variations of said first and second light signals being distinctively different,
means for controlling the degree of optical coupling between said third light guide means and each of said first and second light guide means in accordance with the position of said member, and
means for detecting the light signal in said third light guide means and for providing an indication in accordance with the extent to which said light signal exhibits the distinctive characteristics of said first or second light signals.

4,572,949
FIBER OPTIC SENSOR FOR DETECTING VERY SMALL DISPLACEMENTS OF A SURFACE

John E. Bowers, Holmdel, N.J., and Gordon S. Kino, Stanford, Calif., assignors to The Board of Trustees of the Leland Stanford Junior University, Stanford, Calif.

PCT No. PCT/US83/00533, § 371 Date Dec. 14, 1983, § 102(e) Date Dec. 14, 1983, PCT Pub. No. WO83/03684, PCT Pub. Date Oct. 27, 1983
Continuation-in-part of Ser. No. 368,425, Apr. 14, 1982, abandoned. This PCT application Apr. 13, 1983, Ser. No. 565,091
Int. Cl.[4] H01J 5/16
U.S. Cl. 250—227 36 Claims



1. An apparatus for detecting small displacements of a surface comprising:
a first directional coupler for dividing a single coherent light signal into first and second coherent light signals;
a first delay line for delaying said first coherent signal relative to said second coherent light signal by a first delay period to provide a delayed first light signal;

a waveguide for directing each of said delayed first and said second light signals onto said surface to produce a first reflected light signal corresponding to said delayed first light signal and a second reflected light signal corresponding to said second light signal;

a second delay line for delaying said second reflected light signal by said first delay period to produce a second delayed reflected light signal; and

a detector for measuring the phase difference between said first reflected light signal and said second delayed reflected light signal to measure variations in the geometric path length between said waveguide and said surface.

4,572,950

FIBER-OPTICAL PRESSURE DETECTOR

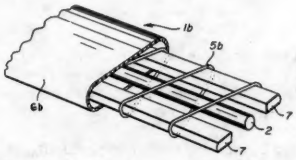
Alan L. Harmer, Plan Les Ouates, Switzerland, assignor to Battelle Memorial Institute, Carouge, Switzerland

Filed Dec. 17, 1982, Ser. No. 450,809

Claims priority, application Switzerland, Dec. 21, 1981, 8152/81

Int. Cl.⁴ G02B *5/14*

U.S. Cl. 250—227 **11 Claims**



1. A pressure-detecting device comprising:

an optical fiber;

a light source juxtaposed with one end of said fiber for illuminating same;

a photodetector confronting the opposite end of said fiber for indicating the intensity of light from said source transmitted through said fiber; and

pressure-transmitting means encompassing at least a section of said fiber, said pressure-transmitting means including a member of substantially incompressible material helicoidally wound about said section in a multiplicity of equispaced flattened turns whereby said turns form a helix of oval cross section about said fiber and in contour therewith, said fiber having a core of radius r with a refractive index n_c and an envelope with a refractive index n_o lower than n_c, said turns being spaced apart by a distance equal to

$$\frac{4\pi r}{\sqrt{1-\left(\frac{n_o}{n_c}\right)^2}}$$

4,572,951

SYSTEM FOR DETECTING AN ABSOLUTE POSITION

Jitsuo Toda, Koganei, and Wataru Shimizu, Fuchu, both of Japan, assignors to Kabushiki Kaisha SG, Tokyo, Japan

Filed Dec. 17, 1982, Ser. No. 450,634

Claims priority, application Japan, Dec. 21, 1981, 56-205138

Int. Cl.⁴ G01D *5/34*

U.S. Cl. 250—231 SE **29 Claims**

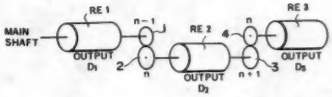
1. A system for detecting, in an absolute value, a position of an object which displaces mechanically from a predetermined origin comprising:

a plurality of detectors each generating, at a predetermined period, an output signal representing an absolute value below one period;

means for providing each of said detectors with a data signal representing the displacement of said object in such a manner that one period of each of said data signals corresponds to mutually different predetermined amounts of displacement of said object, which amounts of displacement differ from one another;

determination means for determining the number of periods from said origin to the present position of said object with respect to a first one of said detectors, employing, as a parameter, the output signals of said respective detectors representing values below one period in correspondence to the present position of said object; and

said present position of said object being identified in an absolute value by a combination of an integer section of the number of periods determined by said determination means and a value below one period represented by the output signal of said first detector,



wherein each of said detectors comprises a primary winding means and a secondary winding means, a member displacing relatively with respect to said primary and secondary winding means and causing a periodic reluctance change to be produced in a magnetic circuit of said winding means in correspondence to said displacement, and output signal generation means,

said primary winding means being excited by at least two reference AC signals out of phase with each other to produce in said secondary winding means an output AC signal which is derived from each of said reference AC signals by phase shifting it in accordance with the relative displacement of said member, and

said output signal generation means measuring the phase difference between one of said reference AC signals and said output AC signal thereby generating data corresponding to the measured phase difference as said output signal.

4,572,952

POSITION SENSOR WITH MOIRE INTERPOLATION

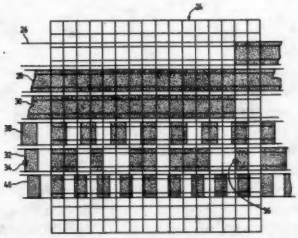
Adrian A. C. March, Bordon, England, assignor to Adrian March Research Ltd., Hampshire, England

Filed Jul. 26, 1983, Ser. No. 517,262

Claims priority, application United Kingdom, Jul. 28, 1982, 8221783

Int. Cl.⁴ G01B *11/00*; G01D *5/38*

U.S. Cl. 250—237 G **11 Claims**



1. A position sensor comprising:

a detector having a plurality of sensitive elements extending

in a two-dimensional array, adjacent sensitive elements in said detector having a first pitch therebetween;

at least one scale having at least one track of indicia, said at least one scale being movable relative to said detector, adjacent indicia of at least part of said at least one track of indicia having a second pitch therebetween, said second pitch being less than twice but not equal to said first pitch, said indicia of at least part of said at least one track of indicia acting on sensitive elements of at least part of said two dimensional array, each sensitive element of said at least part of said two-dimensional array being adapted to detect the overlap between that sensitive element and a corresponding one of said indicia of said at least part of said at least one track, and generate an output in dependence upon said overlap; and

means for processing said outputs of said sensitive elements in said at least part of said two dimensional array, thereby to determine the position of said at least one scale relative to said detector.

4,572,953

INFRA RED PHOTO DETECTOR SYSTEMS

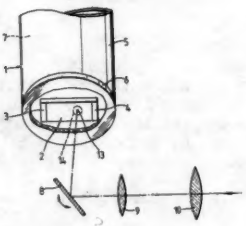
Charles T. Elliott, and Anthony M. White, both of Malvern, England, assignors to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Filed Apr. 18, 1983, Ser. No. 485,888

Claims priority, application United Kingdom, Apr. 19, 1982, 8211291

Int. Cl.⁴ H01L *31/00*

U.S. Cl. 250—338 **11 Claims**



1. An infra red photo detector apparatus comprising:

a photoconductive element having a photosensitive region located between at least one pair of bias electrodes;

optical means for imaging a light source in a scene on to the photosensitive region;

biasing means arranged to provide a DC bias to the photoconductive element and provide an output signal therefrom;

means for scanning the light source image position on the photosensitive region at a rate which is slow compared to photo-carrier drift velocity and in a direction opposite to photo-carrier flow direction; and

means for timing the element output signal modulation produced in response to and as a function of light source image scan position.

4,572,954

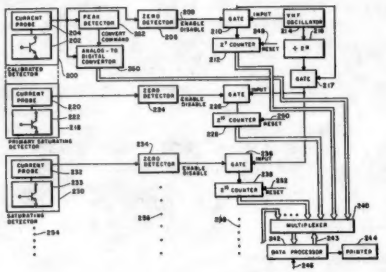
RADIATION MEASURING SYSTEM USING TRANSISTER FLUX SENSORS

Vernal Josephson, Palos Verdes Estates, and Edmond L. Greenberg, Culver City, both of Calif., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jun. 11, 1984, Ser. No. 619,240

Int. Cl.⁴ G01T *1/24*

U.S. Cl. 250—370 **32 Claims**



1. Radiation dosimeter apparatus comprising:

a saturable PN junction quiescently biased into forward conduction and located to receive an unknown sub microsecond pulse of radiation from an ionizing radiation source;

means for measuring the time required after termination of said radiation pulse for said PN junction to return from saturated condition to said quiescent forward biased condition;

predetermined correlating means, relating saturation time with radiation intensity, for converting the measured saturation time to a measure of radiation intensity.

4,572,955

RADIATION IMAGE STORAGE PANEL

Masanori Teraoka; Terumi Matsuda, and Hisashi Yamazaki, all of Kaisei, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Oct. 25, 1983, Ser. No. 545,163

Claims priority, application Japan, Oct. 26, 1982, 57-186674

Int. Cl.⁴ G01J *1/58;* **G01N** *21/64;* **G01T** *1/00;* **H05B** *33/00*

U.S. Cl. 250—483.1 **7 Claims**

1. A radiation image storage panel comprising a support and a phosphor layer provided thereon which comprises a binder and a stimulable phosphor dispersed therein, characterized in that a friction-reducing layer having a surface of a friction coefficient of not more than 0.6 is provided on at least one of the support-side surface and the phosphor layer-side surface thereof.

4,572,956

ELECTRON BEAM PATTERN TRANSFER SYSTEM HAVING AN AUTOFOCUSING MECHANISM

Toru Tojo, Yamato; Ichiro Mori, Tokyo; Toshiaki Shinozaki, Yokohama; Kazuyoshi Sugihara, Kawasaki; Mitsuo Tabata, Yokohama, and Chikara Itoh, Tokyo, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Aug. 22, 1983, Ser. No. 525,419

Claims priority, application Japan, Aug. 31, 1982, 57-150928; Dec. 22, 1982, 57-223980

Int. Cl.⁴ H01J *37/30*

U.S. Cl. 250—492.2 **18 Claims**

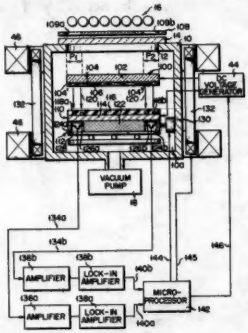
1. An apparatus for transferring a desired fine pattern onto a target body, such as a substrate having a resist film, by the use of electron beams, comprising:

container means for defining a transfer chamber which is evacuated to a predetermined vacuum level;

photoelectrical transducing mask means provided in the transfer chamber and arranged in a spaced apart relation to the substrate, having a pattern to be transferred onto the resist film of the substrate and adapted to receive light to permit a photoelectron beam pattern corresponding to the pattern of the mask means to be emitted onto the resist film;

table means movably provided in the transfer chamber to support the substrate thereon;

magnetic field generating means positioned around said container means, for generating a magnetic field of a predetermined intensity in a space between the substrate and the mask means in said transfer chamber;



voltage generator means provided outside said container means, for applying a DC voltage between the substrate and the mask means to create an electric field therebetween;

defocus detector means for, when an electron beam pattern image is formed on the resist film of the substrate, automatically detecting the defocusing of the photoelectron beam pattern on the substrate and for producing a detection signal; and

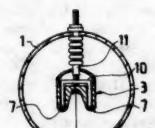
focusing controller means, connected to said voltage generator means and said defocus detector means, for controlling, in response to the detection signal, said voltage generator means so as to vary the apolied DC voltage and vary the electric field according to the amount of detected defocusing, thereby compensating for said amount of defocusing.

4,572,957

MEANS FOR CREATING AN ELECTRON CURTAIN

Pertti Puumalainen, and Pertti Sikanen, both of Kuopio, Finland, assignors to Enso-Gutzeit Oy, Helsinki, Finland

Filed May 3, 1984, Ser. No. 606,704
Claims priority, application Finland, May 3, 1983, 831532
Int. Cl.[4] H01J *37/15, 33/00*
U.S. Cl. 250—493.1 **4 Claims**



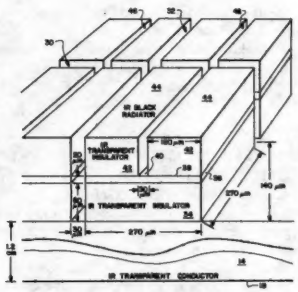
1. A means for creating an electron curtain comprising an elongated, electron-emitting filament, a shell encircling the filament to that the filament is located in an elongated depression formed by the shell, members for accelerating the electrons, and a chamber in which the filament with its encircling shell has been placed and the wall of which contains a window transparent to electrons, through which the electron curtain can be directed, the shell encircling the filament being shaped on both margins of the depression into an accelerating electrode which can be brought to a negative potential with reference to the wall of the chamber, and the depression constituting a diffusion space for the electrons emitted from the filament, in the region of said space there being mouldable parts by the aid of which the admission of electrons into the accelerating electric field and thereby the intensity of the electron curtain that is produced are adjustable, the shell comprises movable parts by the aid of which it is possible to change at least one of the shape of the depression and the spacing of the electrodes and thereby to regulate the admission of electrons into the accelerating electric field, and that the shell has been connected to the outside of the chamber by means of a mechanism enabling the shell parts to be moved while the means is in operation.

4,572,958

INFRARED IMAGER

William W. Durand, Edina, and Gary R. Knowles, Arden Hills, both of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Aug. 31, 1984, Ser. No. 646,392
Int. Cl.[4] G01J *1/00*
U.S. Cl. 250—495.1 **14 Claims**



1. A device for producing an image including infrared wavelengths, comprising:

means for displaying said image including a thermal conductor, a thermal insulator and a radiating material, wherein said conductor is adjacent to and in contact with said insulator, but wherein a portion of said conductor is not in contact with said insulator, and wherein said conductor and said insulator are substantially transparent to said wavelengths, and said radiating material is adjacent to and in contact with said insulator and is substantially opaque and strongly emitting over said wavelengths; and

means for heating said portion of said conductor to a temperature sufficient to cause said radiating material to radiate said image.

4,572,959
CONTAINER FOR THE INTERIM AND LONG-TERM STORAGE OF RADIOACTIVE MATERIAL

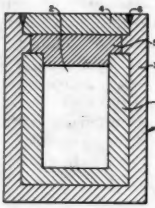
Franz-Wolfgang Popp, Wedemark, and Kurt Feuring, Solms, both of Fed. Rep. of Germany, assignors to Deutsche Gesellschaft für Wiederaufarbeitung von Kernbrennstoffen mbH, Hanover, Fed. Rep. of Germany

Filed Dec. 21, 1982, Ser. No. 451,934

Claims priority, application Fed. Rep. of Germany, Dec. 21, 1981, 3150663

Int. Cl.⁴ G21F *5/05*

U.S. Cl. 250—506.1 **6 Claims**



1. A container for the interim and long-term storage of radioactive material such as irradiated nuclear reactor fuel elements comprising:

a vessel having a base and a wall extending upwardly from said base, said wall terminating in an upper end portion defining the opening of the vessel through which the radioactive material to be stored therein is passed;

said vessel being a double-walled body having an inner wall made of a mechanically strong material selected from the group consisting of nodular cast iron and gray cast iron and having an outer wall cast in surrounding relationship to said inner wall thereby defining an interface therebetween, said outer wall being made of a corrosion-resistant, high-alloy austenitic castable material containing nodular graphite;

fusion bond means extending over all of said interface between said inner wall and said outer wall for tightly joining said walls to each other; and,

a cover weldable to said outer wall at said upper end portion for closing said opening and sealing said container with respect to the ambient.

4,572,960
USE OF METALLIZED KNITTED NET FABRICS FOR PROTECTION AGAINST MICROWAVE RADIATION

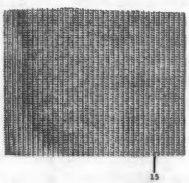
Harold Ebneth, Leverkusen; Hans G. Fitzky, Odenthal; Gerhard D. Wolf, Dormagen, and Henning Giesecke, Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Nov. 1, 1982, Ser. No. 438,190

Claims priority, application Fed. Rep. of Germany, Nov. 21, 1981, 3146233

Int. Cl.⁴ G21F *3/02*

U.S. Cl. 250—516.1 **13 Claims**



1. In a method of protecting the body, especially the eyes, against microwave radiation of a power density range up to 200 mW/cm^2 in the frequency range from 0.2 to 10 GHz comprising covering those parts of the body to be protected with a metallized textile fabric, wherein the improvement comprises said fabric including a metal layer deposited on individual filaments of the fabric, said fabric having a shielding effectiveness which exceeds 20 db and a light transmission of more than 90 to 95%, said fabric being impregnated with a polyurethane.

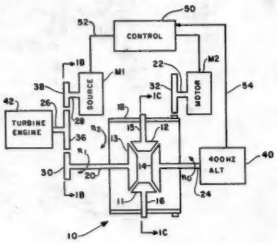
4,572,961
CONSTANT SPEED DRIVE WITH COMPENSATION USING DIFFERENTIAL GEARS

William U. Borger, Dayton, Ohio, assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Apr. 18, 1984, Ser. No. 601,514

Int. Cl.⁴ H02K *7/02*; H02P *15/00*

U.S. Cl. 290—4 R **3 Claims**



1. Apparatus comprising

a differential which mechanically sums the speeds of first and second input shafts and outputs this sum to an output shaft, for driving the output shaft at a desired speed, with the first input shaft mechanically coupled to a power source;

speed compensating means comprising a first electrical machine mechanically coupled to be driven by said power source, a second electrical machine mechanically coupled to said second input shaft, and an electrical power conditioning network electrically coupled between the first electrical machine and the second electrical machine, a speed reference lead connected between a device coupled to the output shaft and the power conditioning network to provide an electrical signal which is a function of the speed of the output shaft, the power conditioning network being operative responsive to said electrical signal to transfer electric power between the first electrical machine and the second electrical machine for driving the second input shaft at a speed which compensates for the difference in speed between the first input shaft and the desired speed of the output shaft;

wherein said first and second electrical machines are each a high-speed, permanent-magnet, brushless, three-phase, variable speed machine having three electrical terminals; wherein the transfer of power between the first and second electrical machines is bidirectional with either operating as a generator while the other is operating as a direct-current motor, depending on the speed of the first input shaft;

wherein said electrical power conditioning network comprises a plurality of switching elements connected in a three-phase to three-phase arrangement between the three electrical terminals of the first electrical machine and the three electrical terminals of the second electrical machine, each switching element having a control electrode for turning it on or off, and control means having output drivers coupled to the control electrodes;

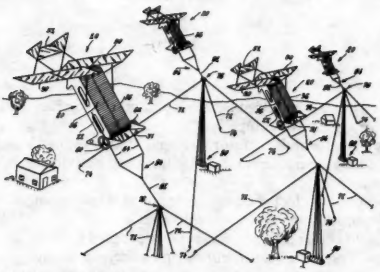
wherein the control means comprises a primary control loop

having said speed reference lead connected as an input, and a secondary control loop, means for sensing position, speed, and currents for the second electrical machine and for supplying signals which are functions thereof for use in the secondary control loop, both the primary and secondary control loops having A/D converter means, and digital processor means having as inputs digital signals from the A/D converter means and outputs to the output drivers.

4,572,962
APPARATUS FOR EXTRACTING ENERGY FROM WINDS AT HIGH ALTITUDES

David H. Shepard, Rye, N.Y., assignor to Cognitronics Corporation, Stamford, Conn.

Filed Apr. 28, 1982, Ser. No. 372,632
Int. Cl.⁴ F03D 3/02
U.S. Cl. 290—55 **21 Claims**



1. Apparatus for extracting energy from air currents at high altitude, comprising:

frame means at said high altitude;

endless belt means supported by said frame means and arranged for movement around a closed path having an ascending leg and a descending leg;

a plurality of air-foil elements secured to said endless belt means for movement around said closed path;

flexible tether means securing said frame means to the surface of the earth;

said air-foil elements being oriented with respect to said endless belt means so as to apply forces from said air currents to said endless belt means effecting (1) motion of said endless belt means around said path, and (2) a lifting force on said frame means tending to move the frame means up and to apply tension to said tether means; and

means responsive to the movement of said endless belt means around said path for transmitting power to the surface of the earth.

4,572,963
APPARATUS FOR CONTROLLING A PLURALITY OF ELECTRICAL DEVICES

Osamu Nakano; Toshikazu Ina, both of Aichi, and Hisasi Kawai, Toyohashi, all of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

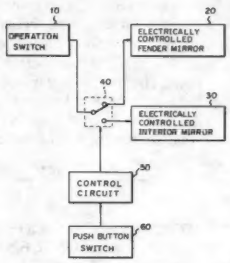
Filed May 16, 1984, Ser. No. 610,804
Claims priority, application Japan, May 30, 1983, 58-96538
Int. Cl.⁴ H02J 3/00
U.S. Cl. 307—10 R **17 Claims**

1. An apparatus for controlling a plurality of electrical devices, comprising:

operation means adapted for controlling said electrical devices, said operation means controlling only one of said devices at any time;

(a) switching means for selectively connecting said operation means to any of said electrical devices, said operation means being normally connected to one of said devices;

means for giving instructions to instruct said connecting of said switching means; and

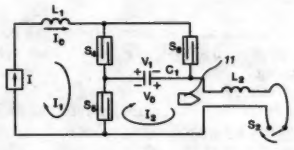


means for controlling said connecting of said switching means, and for connecting said operation means with another of said electrical devices for a predetermined period of time when said instructions are given.

4,572,964
COUNTERPULSE RAILGUN ENERGY RECOVERY CIRCUIT

Emanuel M. Honig, Los Alamos, N. Mex., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Sep. 28, 1984, Ser. No. 655,490
Int. Cl.⁴ H03K 3/00
U.S. Cl. 307—106 **7 Claims**



1. A counterpulse railgun energy recovery circuit for propelling a projectile along a railgun, said counterpulse railgun energy recovery circuit comprising:

a railgun having an effective inductance, said railgun having a breech end, a first and a second rail in parallel, and a muzzle end;

a source inductor initially charged to an initial current, said source inductor having a first end and a second end;

current means for initially charging said source inductor to said initial current, said current means having a first end connected to said first end of said source inductor and a second end connected to said second rail of said railgun at said breech end thereof;

first current-zero type switching means having a first end connected to said second end of said source inductor and a second end;

second current-zero type switching means having a first end connected to said second end of said first current-zero type switching means and a second end connected to said second rail of said railgun at said breech end thereof;

third current-zero type switching means having a first end connected to said second end of said source inductor and a second end connected to said first rail of said railgun at said breech end thereof;

muzzle current-zero type switching means having a first end connected to said first rail of said railgun at said muzzle end thereof and a second end connected to said second rail of said railgun at said muzzle end thereof;

transfer capacitive means having first and connected said second end of said first current-zero type switching means and a second end connected to said first rail of said railgun at said breech end thereof, said transfer capacitive means for cooperating with said first, second, third, and muzzle current-zero type switching means for providing a resonant circuit for transferring current from said source inductor to said effective inductance of said railgun during the propelling of a projectile along said railgun and for returning current from said effective inductance of said railgun to said source inductance after the projectile has exited said railgun.

4,572,965

CIRCUIT FOR DETECTING EXISTENCE OF AN INFORMATION SIGNAL

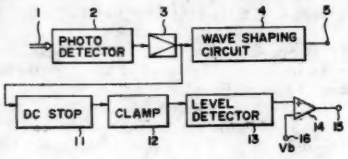
Shinichi Yamamura, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Continuation of Ser. No. 416,334, Sep. 9, 1982, abandoned. This application Apr. 18, 1985, Ser. No. 724,053

Claims priority, application Japan, Sep. 14, 1981, 56-145334

Int. Cl.[3] H03K *17/16*; H04B *15/00*

U.S. Cl. 307—130 **2 Claims**



1. A digital disc reproducing system for reproducing pulse code modulation (PCM) signals optically read from a disc, comprising:

photo detector means for reading a PCM information signal from the disc and creating a reproduced information signal having a waveform similar to a sine curve;

wave shaping circuit means including a differential amplifier having one input connected to receive the PCM information signal and a reference voltage generator connected at another input for creating a reproduced PCM signal having pulses whose time length corresponds to a time length between crossing points of the reproduced information signal waveform across a reference voltage, said wave shaping circuit means also responding in undesirable fashion to a noise output from said photo detector means when it is not reading a PCM information signal from a disc so as to cause an undesired pulse output;

DC stop circuit means for shifting a DC level of the reproduced information signal from the photo detecting means to zero, and a clamp circuit means connected to an output of the DC stop circuit means for clamping peaks at one side of a waveform of the reproduced information signal to a predetermined fixed DC level;

level detecting means for detecting an amplitude level of peaks at the other side of the waveform at the output of said clamp circuit means and producing a DC output having a level corresponding to the detected amplitude level;

means for comparing said DC output from said level detecting means with a predetermined reference voltage to produce an output signal having a first level when said DC output is higher than said reference voltage and a second level when said DC output is lower than said reference voltage; and

said comparing means output signal being connected to control a reproducing apparatus such that when said undesired pulse output occurs from said wave shaping circuit means, the reproducing apparatus is controlled so that an undesirable noise is not reproduced.

4,572,966

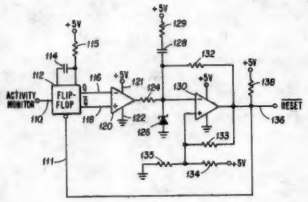
ACTIVITY MONITOR, POWER-ON CLEAR CIRCUIT

Mark N. Hepworth, Cedar Rapids, Iowa, assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Dec. 22, 1983, Ser. No. 564,809

Int. Cl.[4] H03K *3/023*

U.S. Cl. 307—200 A **1 Claim**



1. A power-on clear circuit for an apparatus having an activity monitor capability comprising:

a. a monostable multivibrator having a predetermined unstable timing characteristic, for monitoring activity of said apparatus;

b. a first open collector comparator coupled to the output of said multivibrator for sensing its output; and

c. a second open collector comparator coupled to the output of said first comparator and having a second timing characteristic for issuing a series of reset pulses at an output, the duration of each reset pulse a function of said second timing characteristic, and issuing during the stable condition of said monostable multivibrator; said reset signal input to said multivibrator for initializing said multivibrator, thereby allowing a full duration reset pulse to issue.

4,572,967

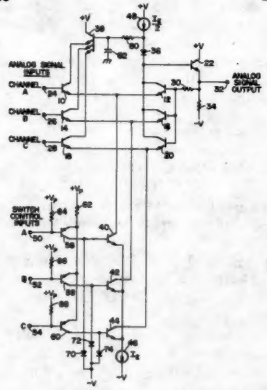
BIPOLAR ANALOG SWITCH

Arthur J. Metz, Gervais, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed Sep. 7, 1982, Ser. No. 415,070

Int. Cl.[4] H03K *17/30, 17/60*

U.S. Cl. 307—243 **10 Claims**



1. A switching circuit, comprising:

a plurality of emitter-coupled pairs of transistors, each pair

consisting of a first transistor having a collector, a base, and an emitter and a second transistor having a collector, a base, and an emitter, wherein the respective bases of said first transistors are coupled separately to a plurality of input terminals and the bases of said second transistors are connected in common, and further wherein the collectors of said second transistors are connected in common;

an output terminal coupled to the common-connected bases of said secon transistors;

a feedback loop coupled from the common collectors of the second transistors to the common bases thereof;

bootstrap means coupled from the collectors of said second transistors to the collectors of said first transistors for maintaining all of the collectors of said first and second transistors at the same potential;

means coupled to said plurality of emitter-coupled pairs of transistors for selectively energizing with a constant current each of said plurality of emitter-coupled pairs of transistors one at a time; and

means coupled to said plurality of emitter-coupled pairs of transistors for splitting said constant current equally between the first and second transistor of the energized pair.

4,572,968

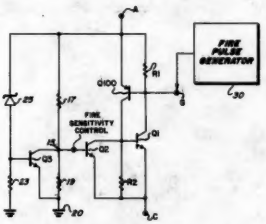
SCR FIRE SENSITIVITY CONTROL AND FIRE CONTROL APPARATUS

Thomas D. Petty, Tempe, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Mar. 4, 1983, Ser. No. 472,374

Int. Cl.⁴ H03K *17/16, 17/60, 17/72*

U.S. Cl. 307—252 G **3 Claims**



1. Silicon controlled rectifier fire control apparatus comprising:

a silicon controlled rectifier having two control gates and two main current carrying terminals;

semiconductor switch means having two controlled terminals, with a low resistance therebetween in a first mode and a high resistance therebetween in a second mode, and a control terminal for changing said switch means from the first mode to the second mode upon the application of a signal thereto, one of the controlled terminals being connected to one of the two control gates of said rectifier and the other of the controlled terminals being connected to one of the main current carrying terminals of said rectifier;

first sensitivity control circuitry connected to the control terminal of said switch means for supplying signals thereto for changing said switch means between the first and second modes, said fire sensitivity control circuitry including a voltage divider network connected to a source of potential and to a reference potential with the control terminal of the switch means being connected to a midpoint potential between the source and the reference, second semiconductor switch means having two controlled terminals, with a low resistance therebetween in a first mode and a high resistance therebetween in a second mode, and a control terminal for changing said switch means from the first mode to the second mode upon the application of a signal thereto, one of the controlled terminals being connected to the midpoint potential of said voltage divider network and the other controlled terminal being connected to the reference potential, potential sensing means connected to the source of potential and the control terminal of the said second semiconductor switch means for maintaining said second semiconductor switch means in the second mode after turn-on of the source of potential until the source of potential substantially reaches a normal value and switching said second semiconductor switch means to the first mode thereafter;

fire pulse generating means connected to the other of the two control gates of said silicon controlled rectifier.

4,572,969

LOW POWER LOSS SNUBBER FOR SWITCHING POWER TRANSISTORS

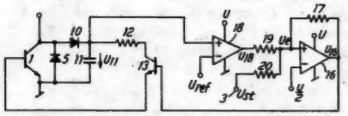
Kjeld Hellegaard, Nordborg; Hans Doktor, Egå , and Niels O. Jacobsen, Hornslet, all of Denmark, assignors to Danfoss A/S, Nordborg, Denmark

Filed Oct. 3, 1983, Ser. No. 538,215

Claims priority, application Fed. Rep. of Germany, Nov. 2, 1982, 3240352

Int. Cl.⁴ H03K *17/04, 17/64*

U.S. Cl. 307—254 **1 Claim**



1. An electronic switching circuit comprising a power transistor having a collector, base and emitter, diode means poled to conduct current in the same direction as the collector-emitter current path of said transistor connected to said collector, capacitor means connected between said diode means and said emitter, discharge resistor means connected to a junction of said diode means and said capacitor means, transistor means coupled between said discharge resistor means and said power transistor base poled to conduct current in the same direction as the collector-emitter path of said power transistor base to effect a discharge of said capacitor through the base-emitter path of said power transistor, and control means operating said transistor means, said transistor means including a discharge transistor having its collector connected to said discharge resistor means and its emitter connected to said base of said power transistor, said control means including comparator means for controlling said power transistor depending on the charged condition of said capacitor means so that said power transistor can be switched off only when said capacitor is discharged, said comparator means having one input thereof connected to said capacitor means and the output thereof connected to said transistor base, and the other input of said comparator means being coupled to receive control signals for said power transistor.

4,572,970

MILLER CAPACITANCE EFFECT ELIMINATOR FOR USE WITH A PUSH-PULL AMPLIFIER OUTPUT STAGE

Gordon H. Allen, and Kenneth I. Ray, both of Mesa, Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

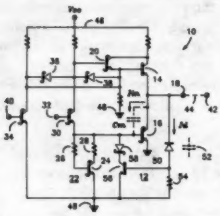
Filed Nov. 19, 1982, Ser. No. 442,937

Int. Cl.⁴ H03K *17/00*

U.S. Cl. 307—254 **14 Claims**

1. In a circuit having a push-pull output stage that includes an upper transistor amplifier and a lower transistor amplifier coupled between first and second power supply conductors and having a circuit output therebetween, the improvement comprising circuit means coupled between the circuit output and the input of the lower transistor amplifier for providing a low impedance path from said input of the lower transistor

amplifier and the second power supply conductor whenever rapid low-to-high transitions occurr at the circuit output to



shunt current transients to the second power supply conductor that may otherwise occur at said input of the lower transistor.

4,572,971

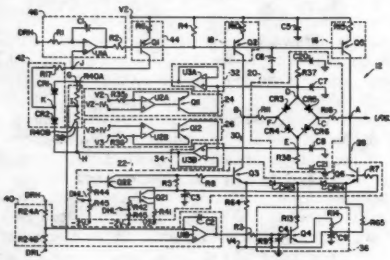
TRI-STATE DRIVER CIRCUIT FOR AUTOMATIC TEST EQUIPMENT

R. Warren Necoechea, Milpitas, Calif., assignor to Fairchild Camera and Instrument Corporation, San Jose, Calif.

Continuation-in-part of Ser. No. 478,611, Mar. 25, 1983, abandoned. This application Mar. 2, 1984, Ser. No. 585,477

Int. Cl.⁴ H03K *5/00*

U.S. Cl. 307—260 **22 Claims**



1. A circuit for selectively generating an output signal equal to a selected one of two reference voltages, said circuit comprising:

first and second current source means for respectively supplying first and second currents, wherein said first and second currents are substantially equal;

bridge means, including first and second nodes and coupled to said first current source means at said first node and to said second current source means at said second node, for providing a path for a bridge current to flow between said first and second nodes;

current sink means for receiving said first and second currents and for maintaining the average voltage of said bridge means equal to the average voltage of said two reference voltages;

feedback means coupled to said bridge means and to said first and second current source means for adjusting the magnitude of said first and second currents so as to cause the voltages at said first and said second nodes to equal said two reference voltages;

current switch means coupled to said first and second nodes of said bridge means for selecting the direction of flow of said bridge current across said bridge means, wherein the voltage at said first node equals the selected one of said two reference voltages; and

wherein the bridge means further includes:

network means for interconnecting a third node with fourth and fifth nodes and for interconnecting said fourth and fifth nodes with a sixth node;

first and second resistors coupled to said network means with said first resistor connected between said first and said third nodes and said second resistor connected between said second and said sixth nodes, wherein said first and second resistors have substantially equal resistance values;

third current source means coupled to said fourth node for supplying a constant current to said bridge means; and

fourth current source means coupled to said fifth node for receiving said constant current from said bridge means.

4,572,972

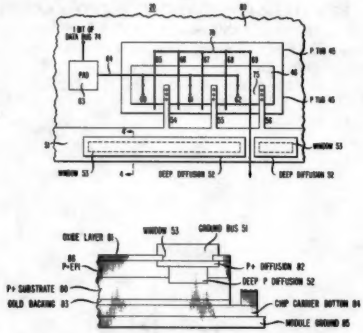
CMOS LOGIC CIRCUITS WITH ALL PULL-UP TRANSISTORS INTEGRATED IN SEPARATE CHIP FROM ALL PULL-DOWN TRANSISTORS

Masakazu Shoji, Warren, N.J., assignor to AT&T Laboratories, Murray Hill, N.J.

Filed Jan. 18, 1983, Ser. No. 458,770

Int. Cl.⁴ H03K *17/687*

U.S. Cl. 307—303 **2 Claims**



1. An IC chip having front and back surfaces, said chip including a first BUS on said front surface, said first BUS being connected through a conductive substrate region of said chip to a metallic layer which coats said back surface, a plurality of pull-down transistors being integrated in said chip and being connected for pulling the voltage levels of bit lines in an external BUS down to the voltage level of the first BUS in response to logic signals applied to the control terminals of the pull-down transistors.

4,572,973

AC CURRENT DETECTION CIRCUIT FOR A ROTOR DRIVING SUPPLY SOURCE OF A ROTATING ANODE X-RAY TUBE

Shigeru Tanaka, Ootawara, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Jan. 10, 1983, Ser. No. 456,850

Claims priority, application Japan, Jan. 13, 1982, 57-2877

Int. Cl.⁴ H03K *5/153, 5/159, 3/30*

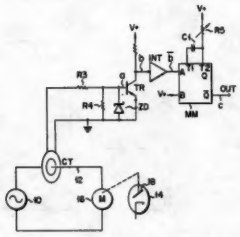
U.S. Cl. 307—350 **3 Claims**

1. A circuit for detecting an AC drive current of a rotor driving supply source for a rotating anode X-ray tube comprising:

a current transformer, magnetically coupled to and electrically insulated from the rotor driving supply source, for producing in an output circuit thereof, a first AC voltage signal that is a function of both an amplitude of the AC rotor driving current and a saturation characteristic of said transformer;

saturation circuit means, connected to the current transformer output circuit and including at least first and second resistors series connected to each other, for providing a second AC voltage signal across one of said first and second resistors that is lower in magnitude than said first AC voltage signal;

voltage clipper means, connected to said saturation circuit means, for limiting said second AC voltage signal to a first predetermined voltage level to provide an AC clipped voltage;



a switching element, connected to said clipper means, operative in response to said AC clipped voltage exceeding a second predetermined voltage level that is lower than said first predetermined voltage level; and

retriggerable monostable multivibrator means, connected to the switching element, for providing a first output state when said AC clipped voltage is at least equal to said second voltage level and a second output state when said AC clipped voltage falls below said second voltage level, the output of said multivibrator being an indicator of the AC drive current.

4,572,974

SIGNAL-LEVEL CONVERTER

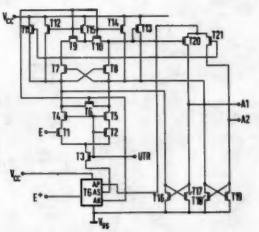
Focko Frieling, Munich, and Ewald Michael, Haar, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jul. 8, 1983, Ser. No. 512,210

Claims priority, application Fed. Rep. of Germany, Jul. 9, 1982, 3225803

Int. Cl.⁴ H03K *19/094, 3/023, 3/356;* **G11C** *8/00*

U.S. Cl. 307—475 **6 Claims**



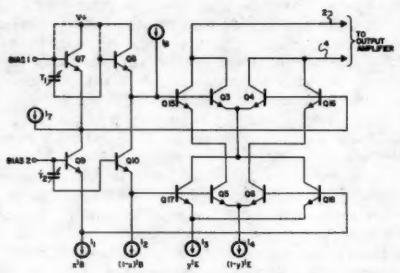
1. Signal-lever converter circuit for controlling digital MOS circuits, comprising a first supply potential source, a second supply potential source delivering a reference potential, an auxiliary potential source delivering an auxiliary potential lying between said first and second supply potentials, a common clock generator having first, second and third outputs delivering first, second and third auxiliary signals, respectively, first and second converter signal outputs carrying signals being inverted relative to each other for controlling the digital circuit, a signal input for receiving a digital control signal to be processed, and first through twenty-first field-effect transistors each having a gate terminal and current-carrying terminals in the form of a source terminal and a drain terminal defining a source-drain path, said signal input being connected to said gate terminal of said first transistor, said source terminals of said first and second transistors being connected together to said drain terminal of said third transistor, said source terminal of said third transistor being connected to said first output of said clock generator, said drain terminal of said first transistor being connected through said fourth transistor to one of said current-carrying terminals of said sixth transistor, said drain terminal of said second transistor being connected through said fifth transistor to the other of said current-carrying terminals of said sixth transistor, said one current-carrying terminal of said sixth transistor also being connected to said source terminal of said seventh transistor and to said gate terminal of said eighth transistor, said other current-carrying terminal of said sixth transistor also being connected to said source terminal of said eighth transistor and to said gate terminal of said seventh transistor, said ninth and tenth transistors being connected together in series between said drain terminal of said seventh transistor and said drain terminal of said eighth transistor, said source-drain paths of said eleventh and twelfth transistors being connected together in parallel between said source terminal of said seventh transistor and said first supply potential source, said source-drain paths of said thirteenth and fourteenth transistors being connected together in parallel between said source terminal of said eighth transistor and said first supply potential source, said gate terminal of said eleventh transistor being connected to said drain terminal of said seventh transistor, said gate terminal of said thirteenth transistor being connected to said drain terminal of said eighth transistor, said ninth and tenth series-connected transistors defining a circuit node therebetween connected through said fifteenth transistor to said first supply potential source, said gate terminals of said fifteenth, sixth, ninth, tenth, twelfth and fourteenth transistors being jointly connected to said second output of said clock generator, said gate terminals of said second, third, fourth and fifth transistors being jointly connected to said auxiliary potential source, said sixteenth and seventeenth transistors having cross connected drain and gate terminals forming a first RS flip-flop, said eighteenth and nineteenth transistors having cross connected drain and gate terminals forming a second RS flip-flop, said source terminals of said sixteenth, seventeenth, eighteenth and nineteenth transistors being connected to said second supply potential source, said drain terminal of said sixteenth transistor being connected to said source terminal of said seventh transistor, said drain terminal of said eighteenth transistor being connected to said source terminal of said eighth transistor, said drain terminal of said seventeenth transistor being connected to said source terminal of said twentieth transistor, said drain terminal of said nineteenth transistor being connected to said source terminal of said twenty-first transistor, said gate terminal of said twentieth transistor being connected to said drain terminal of said eighth transistor, said gate terminal of said twenty-first transistor being connected to said drain terminal of said seventh transistor, said drain terminals of said twentieth and twenty-first transistors being connected to said third output of said clock generator, said auxiliary signals delivered by said clock generator being matched to each other in such a manner that the effective level of said first and second auxiliary signals are given substantially simultaneously and the effective level of said second auxiliary signal is set higher than the effective level of said first auxiliary signal, said third auxiliary signal being at substantially the same effective level as said second auxiliary signal and being reached immediately upon the occurence of decay of said first auxiliary signal, said first, second and third auxiliary signals having a zero state given by said reference potential delivered by said second supply potential source, said source terminal of said twentieth transistor being connected to said first converter signal output, and said source terminal of said twenty-first transistor being connected to said second converter signal output.

4,572,975

ANALOG MULTIPLIER WITH IMPROVED LINEARITY

Derek F. Bowers, Sunnyvale, Calif., assignor to Precision Monolithics, Inc., Santa Clara, Calif.

Filed Apr. 2, 1984, Ser. No. 595,905
Int. Cl.[4] G06G 7/12
U.S. Cl. 307—498 16 Claims



1. In an analog multiplier circuit for multiplying two signals X and Y, the circuit including current sources having magnitudes xI_B, $(1-x)I_B$, yI_E and $(1-y)I_E$, where x and y are dimensionless indices of X and Y, respectively, in the range zero to unity and I_B and I_E are fixed currents, first and second differential amplifiers each comprising a pair of bipolar transistors with a common collector-emitter circuit connection; the yI_E and $(1-y)I_E$ current sources connected to supply current to the first and second amplifiers, respectively, said amplifiers providing an output for the multiplier circuit, and a base drive circuit connected in circuit with the xI_B and $(1-x)I_B$ current sources to provide base drive current to said amplifier transistors, the improvement comprising a base drive circuit which comprises:

first and second bipolar transistors having their collector-emitter circuits connected in circuit with the xI_B and $(1-x)I_B$ sources, respectively,

third the fourth bipolar transistors having their collector-emitter circuits connected in circuit with the xI_B and $(1-x)I_B$ current sources, respectively,

means connecting the collector-emitter circuits of the first and second transistors to provide base drive currents to respective transistors in the first amplifier,

means connecting the collector-emitter circuits of the third and fourth transistors to provide base drive currents to respective transistors in the second amplifier,

first bias means connected to apply bias voltages to the bases of the first and second transistors,

first voltage trimming means connected to apply a trimming voltage differential between the bases of the first and second transistors and thereby adjust the voltage offset between those transistors,

second bias means connected to apply bias voltages to the bases of the third and fourth transistors, and

second voltage trimming means connected to apply a trimming voltage differential between the bases of the third and fourth transistors independently of the first voltage trimming means, and thereby independently adjust the voltage offset between those transistors,

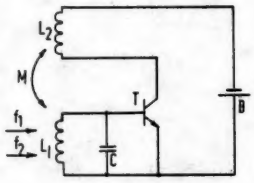
whereby nonlinearities between the multiplier circuit output and the X voltage signal may be reduced by appropriate trimming of said base voltage differentials.

4,572,976

TRANSPONDER FOR ELECTROMAGNETIC DETECTION SYSTEM WITH NON-LINEAR CIRCUIT

Tallienco W. H. Fockens, Eibergen, Netherlands, assignor to N.V. Nederlandsche Apparatenfabriek Nedap, De Groenlo, Netherlands

Filed Dec. 6, 1983, Ser. No. 558,579
Claims priority, application Netherlands, Dec. 10, 1982, 8204802
Int. Cl.[4] H01J 19/82; H05K 1/04
U.S. Cl. 307—524 8 Claims



1. A detection wafer with a non-linear circuit for an electromagnetic detection system wherein two different transmission frequencies are used, comprising:

a resonant circuit including a coil and a capacitor providing a certain bandwidth of resonance;

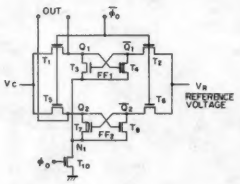
a non-linear element connected to said resonant circuit forming from the two different transmission frequencies a third frequency to be detected, said non-linear element forming part of an amplifying semiconductor circuit, said amplifying semiconductor circuit connected to a supply battery and having an input circuit coupled to said resonant circuit and an output circuit including a coil magnetically coupled to said coil of said resonant circuit, the bandwidth of said resonant circuit comprising said two different transmission frequencies and said third frequency to be detected.

4,572,977

RANGE CHECKING COMPARATOR

Yoshihiro Takemae, Tokyo, and Yasuo Suzuki, Yokohama, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Dec. 13, 1983, Ser. No. 560,953
Claims priority, application Japan, Dec. 24, 1982, 57-225825
Int. Cl.[4] H03K 5/24; G01R 19/165; G11C 7/06
U.S. Cl. 307—530 6 Claims



1. A comparator, comprising:

a first flip-flop circuit having first and second terminals, said first flip-flop circuit changing from a first state to a second state when a voltage applied to said first terminal is larger by a first amount than a voltage applied to said second terminal;

a second flip-flop circuit having third and fourth terminals, said second flip-flop circuit changing from the first state to the second state when a voltage applied to said third terminal is smaller by a second amount than a voltage applied to said fourth terminal;

first and second switching circuits which, respectively,

connect said first terminal and said third terminal to a common voltage source to be compared;

third and fourth switching circuits which, respectively, connect said second terminal and said fourth terminal to a common reference voltage source; and

a fifth switching circuit, commonly connected to said first flip-flop circuit and said second flip-flop circuit, for activating said first and second flip-flop circuits.

4,572,978

COMMUTATOR STUD VIBRATION DAMPING ARRANGEMENT

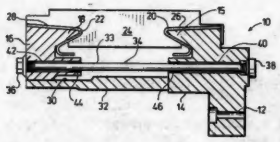
Martin VanDuyn, Peterborough, Canada, assignor to Canadian General Electric Company Limited, Toronto, Canada

Filed Jul. 6, 1984, Ser. No. 628,477

Claims priority, application Canada, Jun. 20, 1984, 457040

Int. Cl.[4] H02K *5/24*

U.S. Cl. 310—51 8 Claims



1. An electric commutator comprising:

a plurality of commutator bars arranged in side-by-side relationship;

an annular shell holding one end of each of said bars and a clamp ring holding the opposite ends of said bars; said annular shell and said clamp ring each defining a plurality of axially extending passages therethrough and spaced from one another around said annular shell and said clamp ring respectively, a passage in said shell being in axial alinement with a respective passage in said ring and forming together a pair of passages;

a commutator stud extending through each said pair of passages and adapted to force said clamp ring towards said shell thereby to clamp said bars between said shell and said clamp ring, each said stud having a clearance between itself and each said passage of the pair of passages through which it passes, and a resilient damper means encircling each said stud, at least a significant portion of each of said damper means positioned inside at least one of said passages and being spaced from each axial end of said stud, each said damper means having an outside diameter permitting movement of said stud through said pair of passages, said damper means accommodating misalinement of said stud with said passages to facilitate assembly of said commutator; the clearance between each said damping means and the inside diameter of the passage in which it is positioned being sufficiently small that said damping means engages the wall of said passage in which it is positioned and is compressed in a manner to dampen vibrations set up in said stud when said commutator is in use.

4,572,979

TERMINAL CONNECTIONS AND HOUSING FOR A SMALL ELECTRIC MOTOR FOR WINDSHIELD WIPER

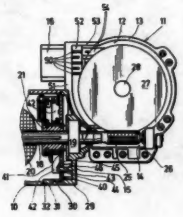
Gerhard Haar, Leinfelden; Heinz Jakob; Hans Prohaska, both of Bietigheim-Bissingen; Theodor Schneider, Freudental; Karl-Friedrich Schubert, Bietigheim-Bissingen, and Werner Wohrle, Brackenheim-Meimsheim, all of Fed. Rep. of Germany, assignors to ITT Industries, Inc., New York, N.Y.

Continuation of Ser. No. 529,953, Sep. 6, 1983, abandoned. This application Apr. 2, 1985, Ser. No. 718,956

Claims priority, application Fed. Rep. of Germany, Sep. 25, 1982, 3235622

Int. Cl.[4] H02K *11/00*

U.S. Cl. 310—68 R 19 Claims



1. A small electric motor for windshield wiper installations, comprising:

a cup-shaped motor housing;

a gear housing having an end shield closing one front side of said motor housing;

a cup for receiving gear elements having a pocket in the bottom of said cup;

interference suppression means positioned in said pocket;

a plug housing provided laterally of said end shield;

connecting contacts extending in the longitudinal direction perpendicular to said end shield, said contacts including leads conducted within said cup to said end shield, each said lead and its corresponding connecting contact being made of sheet metal material in one piece and is arranged on a surface portion of said cup, said surface portion extending parallel to said end shield, the ends of said leads being formed as plugs having a longitudinal direction corresponding to the longitudinal direction of the connecting contacts and are inserted into said end shield;

brushes electrically connected to said connecting contacts and accommodated in said motor housing; and

said gear housing and said plug housing being integrally formed in one piece of plastic material.

4,572,980

STATOR CORE FOR LARGE ELECTRIC GENERATOR WITH DUAL DOVETAIL SLOTS FOR ENGAGING WEDGES

James M. Anderson, Cohoes; William R. Schultz, Jr., Schenectady; Thomas E. VanSchaick, Burnt Hills, all of N.Y., and Frank E. Anderson, Jr., Monroe, Conn., assignors to General Electric Company, Schenectady, N.Y.

Continuation-in-part of Ser. No. 587,428, Mar. 8, 1984, abandoned. This application Sep. 28, 1984, Ser. No. 656,107

Int. Cl.[4] H02K *3/487*

U.S. Cl. 310—214 2 Claims

1. A lamination for stacking to form a stator of a dynamoelectric machine comprising:

a slot-shaped opening in said lamination which, when assembled into said stator, forms a stator slot;

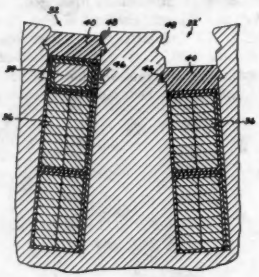
a first dovetail slot in said opening at a first radius from an axis of said stator;

a second dovetail slot in said opening at a second radius from said axis of said stator;

said first radius being effective for receiving a wedge in said

first dovetail slot for securing at least one armature bar in said stator slot; and

said second radius being effective for receiving the wedge in said second dovetail slot for securing a "P" bar and at least



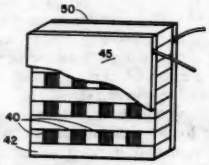
one armature bar in said stator slot, whereby either said at least one armature bar alone or said "P" bar and said at least one armature bar may be respectively secured in said stator slot by selection of which dovetail slot receives said wedge.

4,572,981

TRANSDUCER COMPRISING COMPOSITE ELECTRICAL MATERIALS

John Zola, Ramsey, N.J., assignor to North American Philips Corporation, New York, N.Y.

Division of Ser. No. 523,309, Aug. 15, 1983, Pat. No. 4,514,247.
This application Oct. 1, 1984, Ser. No. 640,737
Int. Cl.[4] H01L *41/08*
U.S. Cl. 310—357 **3 Claims**



1. In a composite piezoelectric material comprising a plurality of rods of a first piezoelectric material which are disposed side-by-side, in a generally parallel alignment, in a matrix of a second passive material, the rods being isolated, one from another, by regions of the second material; the improvement wherein the rods are randomly spaced, one from another.

4,572,982

APPARATUS FOR REDUCING THE EFFECTS OF THERMAL STRESSES ON BREAKDOWN VOLTAGE IN HIGH VOLTAGE VACUUM DEVICES

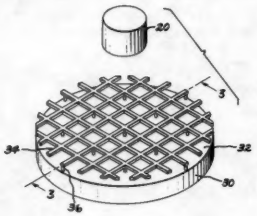
George A. Farrall, Rexford, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Dec. 5, 1983, Ser. No. 557,987
Int. Cl.[4] A47B *88/00*
U.S. Cl. 313—348 **9 Claims**

1. An anode structure for use in high voltage vacuum devices having a cathode and not designed to operate in a plasma conducting state, the anode structure being especially useful for reducing the effects of thermal stresses on the breakdown voltage of high voltage vacuum devices, said anode structure comprising:

an anode having at least one flat surface; and

a mesh of electrically conductive material disposed between said cathode and said anode, said mesh being disposed adjacent to said flat surface and said mesh apertures being configured so that it is substantially transparent to electron beams passing through the mesh from the cathode to



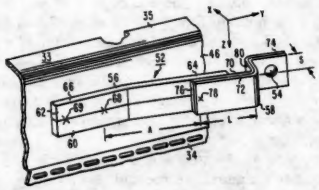
the anode, so that electric fields in the vicinity of said surface are reduced, whereby particles dislodged from said surface by electrons striking said surface, and other particles in the vicinity of said surface, both tend to be retained in the space between said mesh and said surface.

4,572,983

COLOR PICTURE TUBE HAVING AN IMPROVED SUPPORT STRUCTURE FOR A COLOR SELECTION ELECTRODE

Frank R. Ragland, Jr., Lancaster, Pa., assignor to RCA Corporation, Princeton, N.J.

Filed Mar. 29, 1984, Ser. No. 594,849
Int. Cl.[4] H01J *29/07*
U.S. Cl. 313—405 **8 Claims**



1. In a color picture tube having a longitudinal axis, said tube including an evacuated envelope enclosing a substantially rectangular cathodoluminescent screen, a color selection electrode suspended in register with said screen by support means and an electron gun, said support means comprising a plurality of studs attached to said envelope adjacent to the corners of said screen and a plurality of spring assemblies connecting said color selection electrode and said studs, the improvement comprising

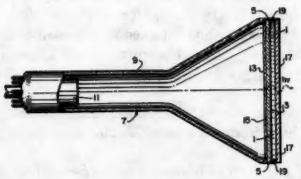
each of said spring assemblies including a first bimetal member attached to said color selection electrode and a second bimetal member having an aperture therein for engaging one of said studs, said first and second bimetal members providing longitudinal and rotational compensation, respectively, for maintaining said color selection electrode in register with said screen when said electrode and said spring assemblies are heated.

4,572,984

BLUE LUMINESCENT CATHODE RAY TUBE DEVICE WITH IMPROVED COLOR FILTERING SYSTEM

Brian J. Fitzpatrick, Ossining, N.Y., assignor to North American Philips Corporation, New York, N.Y.

Filed Apr. 13, 1984, Ser. No. 600,049
Int. Cl.[4] H01J *29/10*
U.S. Cl. 313—467 14 Claims



1. A cathode-ray tube device for generating a bright blue light spot comprising:

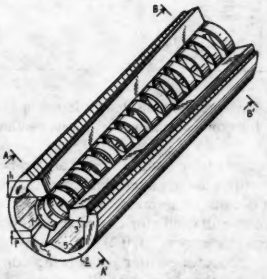
a cathode-ray tube including an evacuated envelope with a face plate; means, located within said envelope, to generate an electronic beam; a silver-activated zinc sulfide phosphor, which emits blue radiation when excited by electrons from said electronic beam and located within said envelope; and in which device there is positioned outside of the external surface of said face plate and in the path of said blue radiation, a light beam filtering means comprising a container, which at least in the path of said blue radiation is transparent to said radiation, containing a concentrated solution of a soluble erbium salt and Methyl Violet 2B.

4,572,985

TRAVELING WAVE TUBE COMPRISING A SLEEVE CUT WITH GROOVES AND ITS MANUFACTURING PROCESS

Jean-Claude Kuntzmann, Boulogne; René Nazet, Eaubonne, and Louis Tarreau, Paris, all of France, assignors to Thomson-CSF, Paris, France

Filed Mar. 28, 1984, Ser. No. 594,230
Claims priority, application France, Mar. 31, 1983, 83 05362
Int. Cl.[4] H01J *25/34*
U.S. Cl. 315—3.5 8 Claims



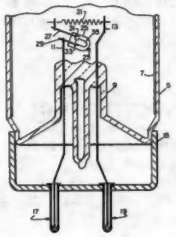
1. Traveling wave tube comprising a helix-type delay line placed in a sleeve cut with grooves, to which it is fixed through the intermediary of dielectric supports of constant height, inserted into the grooves, wherein the helix-type delay line is borne by a conical surface and the depth of the grooves increases with the diameter of the line.

4,572,986

CIRCUIT BREAKER WITH THIN-WALLED BULB

Ronald E. Sindlinger, Muncy, Pa., assignor to GTE Products Corporation, Stamford, Conn.

Filed Apr. 16, 1984, Ser. No. 600,238
Int. Cl.[4] H05B *41/18*
U.S. Cl. 315—74 7 Claims



1. A rapid-start fluorescent lamp comprising:

a glass envelope having a phosphor-coated inner wall surface;

a low pressure fill gas within said glass envelope;

a pair of spaced electrodes positioned within said envelope;

a pair of electrical leads for each of said pair of spaced electrodes sealed into and passing through said envelope with at least one lead of one of said pair of electrical leads connected to one of said pair of spaced electrodes; and having

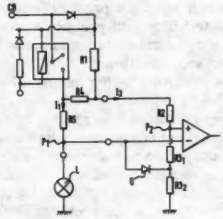
a circuit breaker positioned within said envelope and a pair of electrical conductors coupling the other lead of said one pair of electrical leads to said electrode, said circuit breaker having a glass bulb with said pair of electrical conductors sealed into and passing therethrough, a thermally sensitive bi-metal switch within said glass bulb and connected to said pair of electrical conductors, and said glass bulb having a wall thickness in the range of about 0.016 to 0.018 inch.

4,572,987

LAMP MONITORING CIRCUIT

Derek M. Embrey, Cardiff, Wales; Stuart F. Webb, Wokingham, and Graham J. Legg, Camberley, both of England, assignors to AB Electronic Components Limited, England

Filed Mar. 7, 1984, Ser. No. 586,921
Claims priority, application United Kingdom, Mar. 11, 1983, 8306756
Int. Cl.[4] H01J *1/60*
U.S. Cl. 315—77 8 Claims



1. In a lamp monitoring circuit comprising a resistance bridge circuit including the lamp in one arm of the bridge circuit and fixed resistors as the other arms, and detecting means across the bridge: the improvement that the bridge circuit is connected across a d.c. voltage supply through a high value resistance to limit the current when said lamp is in the

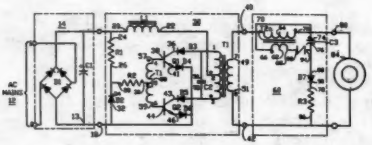
unilluminated state, said high value resistor having a lamp switch connected across it to apply fully supply voltage to the bridge when said lamp is in the illuminated state, the bridge being substantially balanced, when the lamp is fully operable, in both illuminted and unilluminated states, whereby the detecting means across the bridge does not deliver an output signal until a failure of the lamp substantially unbalances said bridge, said bridge having a fixed resistor which is switched between an arm containing said lamp and the remaining arm when said lamp is changed from the unilluminated state to the illuminated state.

4,572,988

HIGH FREQUENCY BALLAST CIRCUIT

Howard Handler, Westminster, and Ronald L. Wilson, Anaheim, both of Calif., assignors to Industrial Design Associates, (IDA), Newport Beach, Calif.

Filed Aug. 22, 1983, Ser. No. 525,229
Int. Cl.[4] H05B *37/02, 39/04, 41/36*
U.S. Cl. 315—209 R **15 Claims**



1. A high frequency ballast circuit having a first and second power input terminals and first and second power output terminals, said high frequency ballast circuit being powered by a filtered dc input voltage source having a positive polarity terminal coupled to the first power input terminal and a negative polarity terminal coupled to the second power input terminal, said high frequency ballast circuit having a starting mode and operating mode for starting and operating a fluorescent lamp load connected between said first and second power output terminals, said starting mode being characterized by said high frequency ballast circuit operation before ionization of said fluorescent lamp load and said operating mode being characterized by said high frequency ballast circuit operation subsequent to ionization of said fluorescent lamp load, said high frequency ballast circuit comprising:

a power oscillator circuit having;

an inductor; said inductor having a first and second terminal,

a first and second resistor; each resistor having a respective first and second terminal,

a first diode having an anode and a cathode,

a first and second NPN transistor, each transistor having a having a collector, an emitter and a base,

a capacitor having a first and second terminal and

a transformer having a primary, a secondary, and a signal control winding, said primary having a first and second terminal and a center-tap, said secondary having at least a first and second terminal,

said signal control winding having a first and second terminal and a center-tap,

said power oscillator first resistor first terminal being coupled to said high frequency ballast circuit first power input terminal and to said inductor first terminal,

said power oscillator first diode cathode being coupled to said power oscillator first resistor second terminal and said power oscillator second resistor first terminal,

said power oscillator second resistor second terminal being coupled to said signal control winding center-tap, said transformer primary center-tap being coupled to said inductor second terminal,

said first transistor collector being coupled to said transformer primary first terminal, said second transistor collector being coupled to said transformer primary second terminal, said first and second transistor emitters being coupled to said power oscillator first diode anode and to said high frequency ballast circuit second power input terminal,

said first transistor base being coupled to said signal control winding first terminal, said second transistor base being coupled to said signal control winding second terminal,

said power oscillator capacitor first terminal being coupled to said transformer primary first terminal, said power oscillator capacitor second terminal being coupled to said transformer primary second terminal,

the phasing relationship between said transformer primary and said signal control winding being characterized to alternately drive each respective transistor into conduction;

said transformer secondary second terminal being coupled to said high frequency balast circuit second output terminals,

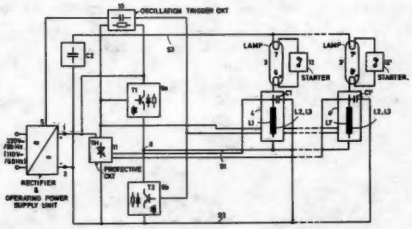
a starting and current limiting circuit means for interposing a periodic voltage pulse between said transformer secondary first termital and said high frequency ballast circuit first power output terminal, said periodic voltage pulse having an amplitude characterized to exceed the ionization potential of said lamp load during said starting mode, said starting and current limiting circuit means additionally providing a predetermined reactance between said first power oscillator output terminal and said high frequency ballast circuit first power output terminal to limit current through said fluorescent lamp load.

4,572,989

RAPID-START, LOW-PRESSURE DISCHARGE LAMP OPERATING CIRCUIT

Anton Zuchtriegel, Taufkirchen, Fed. Rep. of Germany, assignor to Patent-Treuhand Gesellschaft fur electrische Glühlampen mbH, Munich, Fed. Rep. of Germany

Filed Feb. 26, 1982, Ser. No. 352,781
Claims priority, application Fed. Rep. of Germany, Mar. 30, 1981, 3112577
Int. Cl.[4] H05B *37/02, 39/04, 41/36*
U.S. Cl. 315—209 R **18 Claims**



1. Rapid-start, low-pressure discharge lamp operating circuit, particularly for connection to at least one discharge lamp (3, 3') having

a rectifier (5) adapted for connection to an a-c power network, said rectifier having a terminal carrying alternating current, and d-c output terminals (1,2);

a self-excited push-pull oscillator circuit including two serially connected transistors (T1, T2) of the same conductivity type, their collector-emitter paths being connected in series with each other in said oscillator circuit with the same polarity, and the transistors (T1, T2) being connected across the d-c output terminals;

at least one series resonance starting circuit (4, 4') including a ballast inductance (L1, l1') and a capacitor (C1, C1') connected to the at least one lamp,

wherein the two serially connected transistors are further

coupled to said at least one resonance starting circuit (4, 4') and comprising, in accordance with the invention,

means (10) for reliably initiating oscillation of the push-pull oscillator circuit, comprising

a circuit connection (C4) coupling at least one of the transistors (T2) to said terminal of the rectifier (5) carrying alternating current;

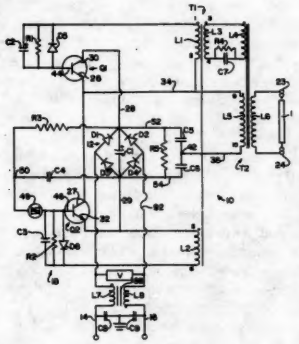
and two emitter resistors (R1*a*, R1*b*), one, each, being respectively coupled to a respective emitter of an associated transistor.

4,572,990

ELECTRONIC TRANSFORMER SYSTEM FOR NEON LAMPS

Luis Leale, San Diego; Edward A. Saunders, Lakeside, and Enrique Keil, San Diego, all of Calif., assignors to International Energy Conservation Systems, Rancho Santa Fe, Calif.

Filed Nov. 23, 1983, Ser. No. 554,185
Int. Cl.[4] H05B *37/02*
U.S. Cl. 315—220 **10 Claims**



1. An electronic transformer system for illuminating lamps comprising:

a full wave rectifying means for receiving alternating current power as an input and for providing direct current power as an output,

a counterphase oscillator means coupled to said full wave rectifying means,

a leakage reactance power transference transformer having a core with a plurality of limbs, a primary winding on one of said limbs and coupled to said counterphase oscillator means, a plurality of dielectric partitions disposed on another of said limbs different from the limb upon which said primary winding is wound, and a secondary winding on said limb with said dielectric partitions wound to have a plurality of sections separated by said dielectric partitions and coupled to lamp terminals, and a feedback winding, and

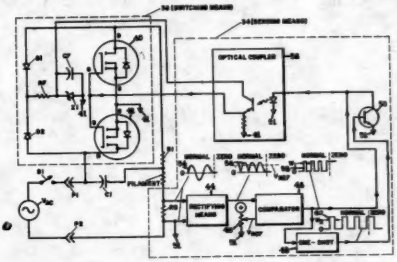
a pulse generator base driving transformer means having a primary winding coupled in series to said feedback winding of said leakage reactance power transference transformer and having secondary winding means for cyclically driving said counterphase oscillator means to provide power to said leakage reactance power transference transformer primary winding alternatingly in opposite directions.

4,572,991

HIGHER EFFICIENCY INCANDESCENT LIGHTING UNIT HAVING AN IMPROVED BALLAST UNIT

Paul T. Cote, Cleveland Heights, Ohio, assignor to General Electric Company, Schenectady, N.Y.

Filed Jan. 16, 1984, Ser. No. 571,008
Int. Cl.[4] H05B *37/00, 39/00, 41/14*
U.S. Cl. 315—240 **10 Claims**



1. In an improved general service incandescent lighting unit having an electrically conductive screw-in base, an outer envelope mounted on said base, an inner envelope coaxially disposed within said outer envelope and containing a halogen gas atmosphere along with a high pressure fill-gas, and a low voltage filament coaxially disposed within said inner envelope, wherein the improvement comprises;

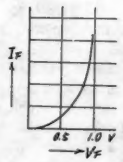
a capacitive ballast circuit comprising a capacitive element of a preselected value and serially connected with the filament, sensing means for sensing the active condition of said capacitive element and developing a control signal on a signal path in response to the condition where the voltage across the capacitive element does not change for a predetermined duration, and switching means rendered conductive in response to said control signal thereby effective to provide a resistive discharge path to cause the capacitive element to be substantially discharged.

4,572,992

DEVICE FOR REGULATING AC CURRENT CIRCUIT

Kazumi Masaki, Osaka, Japan, assignor to Ken Hayashibara, Okayama, Japan

Filed Jun. 1, 1984, Ser. No. 616,165
Claims priority, application Japan, Jun. 16, 1983, 58-106848
Int. Cl.[4] G05F *1/00*; H05B *37/02*
U.S. Cl. 315—310 **11 Claims**



1. A device for regulating an ac current circuit, said device comprising power switch, two or more diodes, series resistance and relay having a set of contacts and magnetic coil, wherein

(a) said power switch, diodes, and series resistance being connected in series;

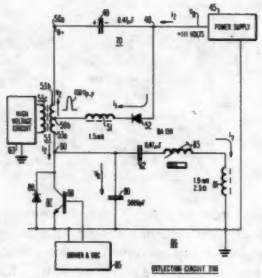
(b) the set of contacts of said relay being connected with said series resistance in parallel; and

(c) the coil of said relay being connected with said diodes in parallel.

4,572,993
TELEVISION DEFLECTION CIRCUIT WITH RASTER WIDTH STABILIZATION

Peter E. Haferl, Adliswil, Switzerland, assignor to RCA Corporation, Princeton, N.J.

Filed Sep. 17, 1984, Ser. No. 651,316
Claims priority, application United Kingdom, Dec. 12, 1983, 8333067
Int. Cl.[4] H01J *29/70, 29/76*
U.S. Cl. 315—408 20 Claims



1. A deflection system with raster width control, comprising:

a deflection winding;

a deflection generator coupled to said deflection winding for generating a trace scanning current and a retrace scanning current in said deflection winding that define corresponding trace and retrace intervals in a deflection period;

a transformer coupled to said deflection generator and including first and second transformer windings in which an alternating current deflection rate voltage is developed;

an ultor circuit coupled to said second transformer winding to produce an ultor voltage that draws a load current from said second transformer winding;

a source of energizing voltage coupled to said transformer;

an inductance coupled to said transformer for conducting in said inductance a current representative of said load current;

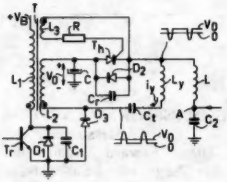
switching means responsive to said voltage in said transformer for decoupling said inductance from said transformer during an interval in said deflection period in which said voltage in said transformer is at a first polarity, and for coupling said inductance to said transformer during the entire interval in said deflection period in which said voltage in said transformer is at the opposite polarity to cause the flow of said current in said inductance, wherein during the time in which said voltage in said transformer is at said opposite polarity, said current in said inductance develops a self-induced voltage in said inductance that is representative of said load current;

means responsive to said self-induced voltage that is representative of said load current for developing at a terminal of said first transformer winding a first voltage that controls the amplitude of said trace scanning current, wherein a change in the value of said load current causes a sufficient change in the value of said current in said inductance such that said change in the value of said current in said inductance by itself produces in said inductance a different value of said self-induced voltage to obtain a corresponding different value of said first voltage and of said trace scanning current for controlling the raster width.

4,572,994
CIRCUIT ARRANGEMENT FOR A PICTURE DISPLAY DEVICE FOR GENERATING A SAWTOOTH LINE DEFLECTION CURRENT

Leonardus A. A. Valkestijn, and Christianus H. J. Bergmans, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jun. 9, 1983, Ser. No. 502,788
Claims priority, application Netherlands, Jun. 21, 1982, 8202499
Int. Cl.[4] H01J *29/70*
U.S. Cl. 315—411 9 Claims

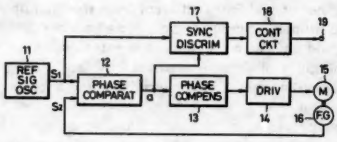


1. A circuit arrangement including a line deflection coil for a picture display device for generating a deflection current having a trace and a retrace through said line deflection coil comprising a controllable supply switch, a power supply transformer having a primary winding and a secondary winding, one end of the primary winding connected to a terminal of a supply voltage source and the other end to said controllable supply switch which is in turn connected to the other terminal of said source, a trace capacitor and a deflection switch connected in series with the secondary winding of said transformer and said line deflection coil to form a loop, a retrace capacitor connected in parallel with said deflection switch, the deflection switch being conductive during the trace period and cut off during the retrace period, the supply switch being conductive during at least a portion of the trace period and cut off during the retrace period, the line deflection coil, the trace and retrace capacitors forming part, during the retrace period, of a resonant network the elements of which determine the duration of the retrace period, a trace rectifier and an inductance connected to said loop, the other end of said inductance connected to a voltage terminal, and a primary capacitor coupled to the primary winding of said transformer for partly determining the duration of the retrace period.

4,572,995
SYNCHRONISM DISCRIMINATING CIRCUIT

Ken Enami, Fujieda, Japan, assignor to Victor Company of Japan, Ltd., Yokohama, Japan

Filed Aug. 8, 1984, Ser. No. 638,867
Claims priority, application Japan, Aug. 26, 1983, 58-155774
Int. Cl.[4] H02P *5/16*
U.S. Cl. 318—314 9 Claims



1. A synchronism discriminating circuit comprising:

phase comparator means supplied with a reference signal having a reference frequency and a reference phase and with an input signal of which a synchronism with respect to said reference signal is to be discriminated, for comparing the phase of said reference signal with the phase of

said input signal and for producing an output signal responsive to a phase difference between the two signals, said reference signal being made up of a series of pulses; and

synchronization detecting circuit means supplied with said reference signal and with the output signal of said phase comparator means, for producing a sychronism detection signal, said synchronization detecting circuit means counting the pulses in said reference signal during a period in which said phase difference is within a predetermined range and producing said synchronism detection signal when at least a predetermined number of pulses in said reference signal are continuously counted.

4,572,996

CONTROL UNIT FOR MODEL VEHICLES

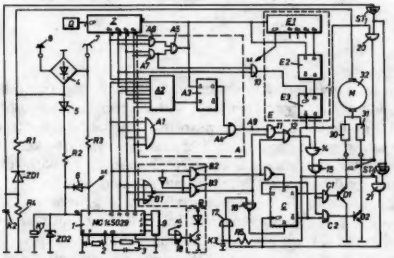
Christoph Hanschke, Göppingen-Faurndau, and Roland Mayer, Reichenbach-Fils, both of Fed. Rep. of Germany, assignors to Gebrüder Märklin & Cie. Gesellschaft mit beschränkter Haftung, Göppingen, Fed. Rep. of Germany

Filed Apr. 19, 1984, Ser. No. 602,183

Claims priority, application Fed. Rep. of Germany, Apr. 22, 1983, 3314714

Int. Cl.⁴ H02P *7/29*

U.S. Cl. 318—341 **11 Claims**



1. A control unit for model vehicles which are supplied with energy, for independent operation, via a common electric circuit, and which are selected by a transmitter which, via a line bus formed by the electric circuit, transmits to a receiver arranged in the model vehicle binary words consisting of an address part and a data part; the receiver, which is coded in conformity with the address part, takes over the received data part in a register having parallel data outputs and transmits it to an analyzer which switches statuses, which correspond to the data, and control elements, which are arranged in the power circuit of the motor of the model vehicle; the improvement comprises:

a counter having a reset imput, which is acted upon by reset pulses of constant frequency, and having a counting input, which is connected with said line bus in such a way that within a time window defined by two reset pulses which follow one another, the pulses of binary words received are counted in;

a storage having a data input which is set as a function of the count of said counter in such a way that below a given count of said counter said data input assumes a first logic status, and on and after said given count assumes a second logic status; the logic status present at said data input is stored in said storage shortly before a following reset pulse; and

a first gate for time-limitedly operating, or for fully connecting through, in conformity with the statuses switched by said analyzer, said control elements as a function of the storage fill of said storage; said storage being a D-flip-flop having a clock input at which is present a clock pulse which in terms of time is slightly in advance of said reset pulse; said D-flip-flop having a Q output state; and which includes as said first gate a first AND-gate for logically interconnecting said Q output state of said D-flip-flop with output signals of said analyzer; said first AND-gate having an output which controls at least one of said control elements.

4,572,997

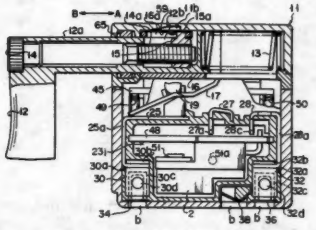
TRIGGER SWITCH

Ken Yamanobe, Kawasaki; Hiroyuki Arai, Kanagawa, and Touru Kasai, Kawasaki, all of Japan, assignors to Fujisoku Electric Co., Ltd., Kawasaki, Japan

Filed Oct. 9, 1984, Ser. No. 658,498

Int. Cl.⁴ H02P *7/00*

U.S. Cl. 318—349 **8 Claims**



1. A trigger switch for changing the resistance of a variable resistor connected to a velocity control circuit upon operating a trigger, comprising:

a switch case;

a trigger disposed to be extended/withdrawn with respect to said switch case;

a contact element arranged in said switch case and interlocked with an operation of said trigger;

first and second storage portions integrally formed in said switch case;

a resistor arranged at the periphery of said first and said second storage portions, wherein said contact element is slidable along said resistor;

a printed circuit board arranged in said first and said second storage portions of said switch case;

an elastic connecting member, provided in said first and said second storage portions, for electrically connecting one side surface of said printed circuit board and said resistor; and

a heating-generating component arranged on the other side surface of said printed circuit board, said heat-generating component forming part of said velocity control circuit;

whereby substantially all of the heat produced by said heat-generating component is radiated to the outside and prevented from affecting the resistance value of said resistor.

4,572,998

TOOL RADIUS COMPENSATION SYSTEM

Ryoichiro Nozawa, Tokyo; Hideaki Kawamura, and Mitsuto Miyata, both of Hachioji, Japan, assignors to Fanuc Limited, Minamitsuru, Japan

Filed Apr. 12, 1983, Ser. No. 484,254

Claims priority, application Japan, Apr. 16, 1982, 57-63310

Int. Cl.⁴ G05B *19/24*

U.S. Cl. 318—572 **3 Claims**

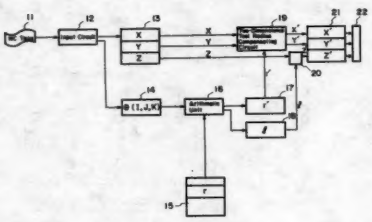
1. An apparatus for tool radius compensation in three-dimensional machining of a workpiece where a tool is offset from a commanded tool path by a distance commensurate with the radius of the tool, comprising:

command means for producing command signals in first, second and third dimensions, with a workpiece contour being commanded in first and second dimensions as a tool path in a prescribed plane sectioning the workpiece;

means for providing tool radius and inclination of a machined surface of the workpiece;

means for computing a first tool offset quantity in the prescribed plane and a second tool offset quantity in a direction at right angles to the prescribed plane, based on the radius of the tool and the inclination of the machined surface;

two-dimensional tool radius compensation means which receives the first and second dimension command signals from said command means for effecting tool radius compensation in the prescribed plane by correcting the first and second dimension command signals based on first tool



offset quantity, and for outputting the corrected first and second dimension command signals;

third dimension tool radius compensation means for correcting tool position in a direction at right angles to the prescribed plane by correcting the third dimension command signal from said command means based on the second tool offset quantity, and for outputting a corrected third dimension command signal; and

means for machining the workpiece in three dimensions based on the corrected first and second dimension signals from said two-dimensional tool radius compensation means and the corrected third dimension signal from said third dimension tool radius compensation means.

4,572,999

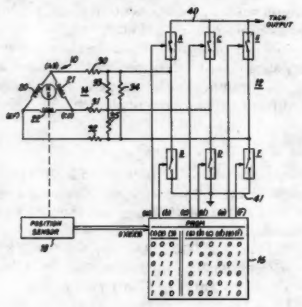
BRUSHLESS TACHOMETER

Philip S. Coulon, Jr., Radford, Va., assignor to Kollmorgen Technologies Corporation, Dallas, Tex.

Filed Jun. 14, 1983, Ser. No. 504,121

Int. Cl.[4] G05B *5/01*

U.S. Cl. 318—618 **5 Claims**



1. A DC tachometer comprising an alternator including a stator,

a rotor, and

windings for producing an alternating signal proportional to the speed of rotation;

a rotor position sensor;

a field effect transistor switching circuit controlled by said position sensor to produce a DC signal proportional to rotor speed from said alternating signal; and

wherein said position sensor indicates position by a digital code and further including a read only memory for converting said digital code into control signals for said field effect transistor switching circuit.

4,573,000

MEASURING INSTRUMENT

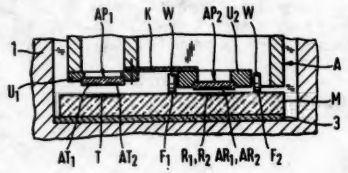
Günther Nelle, Bergen, Fed. Rep. of Germany, assignor to Dr. Johannes Heidenhain GmbH, Traunreut, Fed. Rep. of Germany

Filed Sep. 21, 1984, Ser. No. 653,677

Claims priority, application Fed. Rep. of Germany, Sep. 23, 1983, 3334398

Int. Cl.[4] G05B *1/06*

U.S. Cl. 318—640 **8 Claims**



1. In a measuring instrument for measuring the relative position of two objects shiftable with respect to one another on a first guide, of the type comprising: a scale which defines a measuring graduation extending along a measuring direction, at least one reference mark absolutely positioned with respect to the graduation; a scanning unit adapted to scan both the graduation and the reference mark and to generate scanning signals in response thereto, and an evaluating unit coupled to receive the scanning signals; the improvement comprising:

means for rigidly mounting the scanning unit with respect to one of the two objects such that the scanning unit is guided by the first guide;

a first scanning plate fixedly mounted to the scanning unit to scan the graduation, said first scanning plate defining at least one graduation scanning field aligned with the graduation;

a second scanning plate defining at least one reference mark scanning field adapted to scan the reference mark;

an auxiliary guide, independent of the first guide, which guides the second scanning plate with respect to the reference mark; and

a coupling between the second scanning plate and the first scanning plate which is rigid in the measuring direction.

4,573,001

COIL DENSITY MODULATION

Banchien Lin, 4th Floor, No. 2, Lane 192, Szu-Wei Rd., Taipei 106, Taiwan

Filed Oct. 11, 1983, Ser. No. 540,505

Int. Cl.[4] H02P *6/00, 8/00*

U.S. Cl. 318—695 **10 Claims**

1. A variable speed, self-commutating motor comprising:

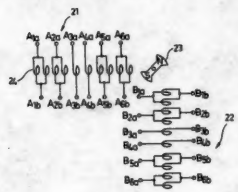
(a) a rotor;

(b) a stator including multiple sets of phase windings for polyphase operation, each said phase winding comprising at least one subwinding; and

(c) communtating means including a plurality of commutator segments connected to said subwindings, different ones of said segments being connected to differing numbers of said subwindings, a pair of slip rings and a pair of brushes, said commutator segments and slip rings being fixed to said stator, said brushes being fixed to and rotating

together with said rotor, each said brush contacting one of said slip rings and a plurality of adjacent ones of said commutator segments simultaneously;

(d) one terminal of any said subwinding being directly connected to one said commutator segment, the other terminal being directly connected to another commutator segment, one of said slip rings being connected to the positive



terminal of a direct-current power source, and the other slip ring being connected to the negative terminal of said power source to energize the subwindings by sequentially connecting to said power source by the simultaneous contact of said slip rings and the respective commutator segments by said brushes, and to thereby cause said rotor and stator to rotate with respect to each other.

4,573,002

SERVOMOTOR CONTROL SYSTEM

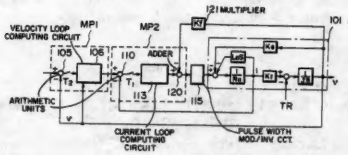
Mitsuo Kurakake, Hino, and Keiji Sakamoto, Hachioji, both of Japan, assignors to Fanuc Ltd, Minamitsuru, Japan

Filed Jul. 23, 1984, Ser. No. 637,220

Claims priority, application Japan, Nov. 25, 1982, 57-206423

Int. Cl.⁴ H02P *5/28*

U.S. Cl. 318—721 **6 Claims**



1. A servomotor control system, connected to receive a velocity command, for controlling a servomotor, comprising:

a velocity sensor, coupled to the servomotor, for sensing the velocity of the servomotor and for generating an actual velocity signal;

a current sensor, coupled to the servomotor, for sensing an actual current flowing into the servomotor and for generating an actual current signal;

a power drive circuit, coupled to the servomotor, for driving the servomotor; and

a control unit, connected to receive the velocity command and coupled to said velocity sensor, said current sensor, and said power drive circuit, for performing a velocity loop computation to derive a current command for the servomotor based on an offset velocity which is the difference between the velocity command for the servomotor and the actual velocity signal, said control unit performing a current loop computation to obtain a command for controlling said power drive circuit said control unit obtaining a velocity compensation signal in the current loop computation by amplifying the actual velocity signal by a predetermined magnification, so that the command for controlling said power drive circuit is compensated by the velocity compensation signal, the velocity loop computation being executed at a period which is longer than the period at which the current loop computation is executed.

4,573,003

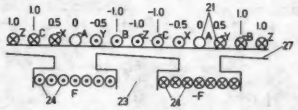
AC MACHINE OPTIMIZED FOR CONVERTER OPERATION

Thomas A. Lipo, Madison, Wis., assignor to Wisconsin Alumni Research Foundation, Madison, Wis.

Continuation of Ser. No. 537,968, Sep. 30, 1983, abandoned. This application Jul. 9, 1985, Ser. No. 753,820

Int. Cl.⁴ H02P *5/40;* H02K *3/18*

U.S. Cl. 318—722 **34 Claims**



1. An electrical machine comrising:

(a) A stator including a core with a cylindrical inner periphery and slots formed therein, and a stator winding having a plurality of phases, each phase formed of a concentrated, full pitch winding disposed in one slot per pole, per phase for each direction of current flow;

(b) A rotor having salient poles with pole faces and means for producing a magnetomotive force over each pole such that the resultant of the rotor field and stator armature flux densities is a quasi-rectangular flux density wave in the air gap between the rotor and stator having the maximum flux density between each pole face and the stator.

4,573,004

VARIABLE ELECTRICAL ENERGY STABILIZER

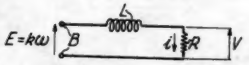
Marcel Hervé , 55, rue Lacordaire, 75015 Paris, France

Filed Jan. 19, 1983, Ser. No. 459,266

Claims priority, application France, Feb. 11, 1982, 82 02263

Int. Cl.⁴ G05F *3/14;* H02M *7/08*

U.S. Cl. 320—51 **21 Claims**



1. A variable electrical energy stabilizer connected to terminals of a variable monophase voltage supply means for supplying a d.c. current to a load having an impedance, said variable monophase voltage amplitude varying with a constant ratio with a variable pulsation rate per unit time, said stabilizer comprising an inductive means series-connected with said load between said supply means terminals, said inductive means having an inductance substantially equal to the quotient of said constant ratio to the amplitude of said d.c. current and having an impedance very high compared to the impedance of said load.

4,573,005

CURRENT SOURCE ARRANGEMENT HAVING A PRECISION CURRENT-MIRROR CIRCUIT

Rudy J. van de Plassche, Sunnyvale, Calif., assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 25, 1984, Ser. No. 573,768

Claims priority, application Netherlands, Feb. 8, 1983, 8300466

Int. Cl.⁴ G05F *3/20;* H03K *13/02*

U.S. Cl. 323—315 **13 Claims**

1. A current-source arrangement comprising:

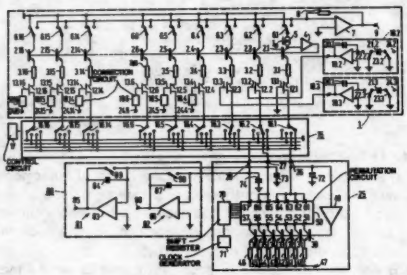
means for generating a plurality of output currents which are substantially in a given current ratio,

means coupled to said generating means for detecting deviations in the values of at least some of the output currents from those required to realize the given current ratio, and

means coupled to said generating means for correcting said output currents so as to reduce the detected deviations applied thereto, characterized in that the means for detecting deviations in the values of the currents comprises:

a precision current-mirror circuit having an input and at least one output on which a current appears whose value is in an accurate ratio to a current on the input,

a coupling network for cyclically coupling at least some of



the output currents from the means for generating a plurality of output currents to the input and at least one output of the precision current-mirror circuit, and

a detection circuit on each output of the precision current-mirror circuit for detecting the difference between the output current from the means for generating a plurality of output currents coupled to said output and the current from the current-mirror circuit which also appears on said output.

4,573,006

APPARATUS FOR FEEDING ALTERNATE POLARITY PULSES TO A LOAD

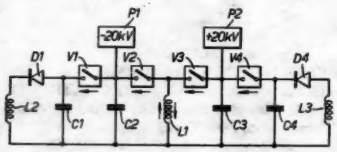
Barry P. Newton, Chelmsford, England, assignor to English Electric Valve Company Limited, Chelmsford, England

Filed Jun. 10, 1983, Ser. No. 503,290

Claims priority, application United Kingdom, Jun. 14, 1982, 8217179

Int. Cl.⁴ H02M *3/315*

U.S. Cl. 323—326 **12 Claims**



1. Apparatus for feeding alternate polarity pulses to a load comprising a power supply for charging a capacitor with alternate polarities between pulses, switching means designed to be switched by electrical signals and forming a path or paths for the discharge of the capacitor through the load and means for closing the switching means at appropriate times to produce the alternate polarity pulses in the load.

4,573,007

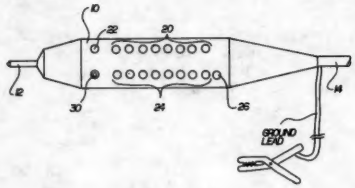
DIGITAL TEST PROBE HAVING MEMORY FOR LOGIC LEVELS AT DIFFERENT TEST LOCATIONS

Joseph P. Mefford, Glen Cove, N.Y., assignor to Harris Corporation, Melbourne, Fla.

Filed May 26, 1983, Ser. No. 498,404

Int. Cl.⁴ G01R *19/155, 1/067*

U.S. Cl. 324—133 **19 Claims**



1. A digital test probe for determining logic levels at different test locations of a digital circuit comprising:

an electrically conductive probe needle for making electrical contact with a said test location;

logic level detection means connected to said needle for providing a data signal having a logic level representative of that at a said test location contacted by said needle;

memory means having N storage locations each for storing a binary level signal indicative of the logic level at an associated one of N said test locations;

N stored data indicator means coupled to said memory means for providing indications of the logic levels at associated ones of said N test locations;

N location indicator means respectively associated with said N stored data indicator means for use in associating the binary level of the stored data with a test location; and

data entry means, for entering each said data signal for storage in a storage location of said memory means associated with one of said N test locations.

4,573,008

METHOD FOR THE CONTACT-FREE TESTING OF MICROCIRCUITS OR THE LIKE WITH A PARTICLE BEAM PROBE

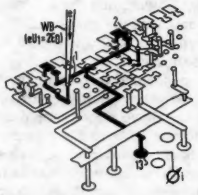
Burkhard Lischke, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jun. 6, 1983, Ser. No. 501,089

Claims priority, application Fed. Rep. of Germany, Sep. 24, 1982, 3235461

Int. Cl.⁴ G01R *31/02*

U.S. Cl. 324—158 R **4 Claims**



1. A method for non-contact testing of a specimen including microcircuitry, comprising the steps of:

providing a particle beam;

charging a first point of the specimen with the particle beam;

after a steady state condition has been achieved at the first point, varying an energy of the particle beam such that it lies in a region of a neutral point energy E_o where a number of electrons leaving the specimen is substantially equal to a number of electrons incident upon the specimen;

subsequently directing said particle beam with energy E_o to at least one further point; and

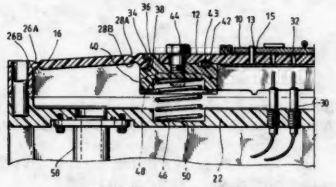
interrogating potential of said further point by detection of triggered secondary electrons by use of a detector without changing a charge condition of the specimen.

4,573,009

PRINTED CIRCUIT BOARD TEST FIXTURE WITH FLEXION MEANS FOR PROVIDING REGISTRATION BETWEEN THE TEST PROBES AND THE CIRCUIT BOARD

Pat Fowler, Castro Valley, and Ernest C. Woods, Jr., Pleasant Hill, both of Calif., assignors to Zehntel, Inc., Walnut Creek, Calif.

Filed Dec. 7, 1983, Ser. No. 558,889
Int. Cl.[4] G01R *31/02;* H01R *4/64*
U.S. Cl. 324—158 F **15 Claims**



1. A test fixture for use in the electrical testing of printed circuit boards comprising;

a substantially rigid platen carrying a plurality of electrical test probes;

a substantially rigid top plate adapted to support a printed circuit board;

a semi-flexible housing attached to the platen and supporting the top plate above the platen, the housing being provided with flexion means adapted to permit movement of the top plate and the circuit board from an upper position in which the circuit board is held spacedly above the probes to a lower position in which the probes are in electrical contact with the circuit board, said flexion means being further adapted to guide the movement of the top plate and circuit board in a substantially linear manner so as to provide that each test probe contacts a predetermined corresponding test point on the circuit board;

means for moving the circuit board from the upper to the lower position; and

means for returning the housing to the upper position when the testing is completed.

4,573,010

MINIATURE CELL ADAPTOR TO ACCOMMODATE SMALL SAMPLES IN RESISTIVITY CELLS

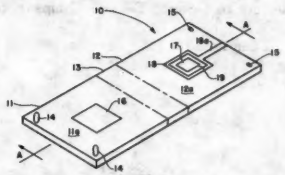
Robert E. Barker, Jr., Charlottesville, Va., and Daniel Y. Chen, Pullman, Wash., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Aug. 31, 1983, Ser. No. 528,309
Int. Cl.[4] G01R *31/02, 27/02;* H01C *1/022*
U.S. Cl. 324—158 F **5 Claims**

1. An adaptor for supporting small samples of material within a resistivity cell having first and second confronting electrodes and a guarding electrode for the second electrode comprising:

a. a first electrically insulating plate having upper and lower surfaces and supporting a first central electrode therethrough, said first central electrode presenting a conductive surface at said upper first plate surface for contacting said first electrode of said resistivity cell, and presenting a second conductive surface of first predetermined size at said lower first plate surface for contacting said sample;

b. a second electrically insulating plate having upper and lower surfaces and supporting a second central electrode therethrough, said second central electrode presenting a first conductive surface of second predetermined size smaller than said first predetermined size of said first central electrode at said upper second plate surface for contacting said sample, and a second conductive surface at said lower second plate surface for contacting said second electrode of said resistivity cell;



c. a guarding electrode in the form of a first marginal conducting strip on said upper surface of said second plate, surrounding and electrically insulated from said second central electrode, and a second conducting strip for electrically interconnecting said marginal strip and said guarding electrode of said resistivity cell; and

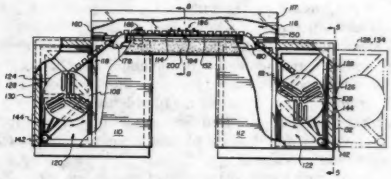
d. said first plate and said second plate disposed in confronting relationship for sandwiching said sample between confronting surfaces of said first and second central electrodes.

4,573,011

METHOD AND APPARATUS FOR TESTING ELECTRO-MECHANICAL DEVICES

Daniel F. Rochat, St-Blaise, Switzerland; Chuck C. Ogawa, Irvine, and Uyen D. Bui, Placentia, both of Calif., assignors to Nouvas Manufacturing Technology Company, Orange, Calif.

Filed May 20, 1983, Ser. No. 496,363
Int. Cl.[4] G01R *31/18;* B65G *35/04;* G01L *27/00*
U.S. Cl. 324—158 F **29 Claims**



14. An apparatus for testing devices whose performance varies with temperature, said apparatus comprising:

fixture means for mounting a plurality of said devices at spaced intervals on an elongated flexible strip;

means for coiling said strip on a first reel so as to provide a first coil comprised of said strip and plurality of said devices;

means for mounting said reel and said first coil in a first chamber;

means for maintaining said first chamber at a controlled first temperature so as to bring said coil substantially to said controlled first temperature;

means for withdrawing said strip from said first reel and intermittently moving said strip through a second chamber;

means for maintaining said second chamber substantially at said controlled first temperature while said strip is being intermittently moved through said second chamber;

probe means located in said second chamber for testing each

of said devices as it moves intermittently through said second chamber; and,

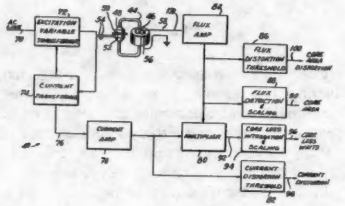
means for receiving said strip from said second chamber.

4,573,012

METHOD AND APPARATUS FOR MEASURING CORE LOSS OF A LAMINATED FERROMAGNETIC STRUCTURE

Donald K. Bisson, and Steven A. Nardin, both of Fort Wayne, Ind., assignors to General Electric Company, Schenectady, N.Y.

Filed Feb. 14, 1983, Ser. No. 465,830
Int. Cl.[4] G01R *33/14*
U.S. Cl. 324—222 **10 Claims**



1. A tester for measuring electrical losses in a flux path of a ferromagnetic structure, said flux path having a predetermined cross-sectional area, comprising:

a first coil for coupling to said structure;

means connectable to said first coil for driving an alternating current therethrough whereby a magnetic flux is produced in said flux path;

a second coil for coupling to said structure and for producing a flux signal in response to said magnetic flux in said flux path;

means connectable to said second coil for scaling said flux signal to produce a voltage related to a fixed value of flux density in said flux path and said predetermined cross-sectional area;

first means connected with said scaling means for indicating said voltage scaled in units of area;

means responsive to said alternating current for developing a first signal indicative of the amplitude thereof;

means responsive to said flux signal for developing a second signal indicative of the magnitude thereof;

means responsive to said first and second signals for multiplying said first signal by said second signal to produce a power loss signal;

second means responsive to said power loss signal for indicating the power loss in said ferromagnetic structure; and

means for adjusting said alternating current driving means to vary the amplitude of said alternating current until said first indicating means produces an indication equal to said predetermined cross-sectional area, whereby a condition for reading the power loss indication on said second indicating means is produced.

4,573,013

MAGNETIC INSPECTION OF REINFORCING STEEL RODS IN PRESTRESSED CONCRETE

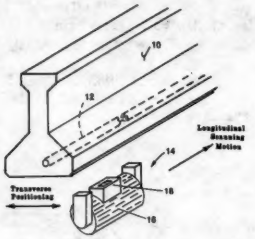
Felix N. Kusenberger, San Antonio; John R. Barton, Bulverde, and George A. Ferguson, San Antonio, all of Tex., assignors to The United States of America as represented by the Secretary of Transportation, Washington, D.C.

Filed Mar. 29, 1982, Ser. No. 363,343
Int. Cl.[4] G01N *27/82*; G01R *33/12*
U.S. Cl. 324—238 **1 Claim**

1. The method of inspecting the steel reinforcing members in prestressed concrete, said members being placed in a plurality of layers, each layer having a plurality of transversely spaced individual members, which comprises:

generating a magnetic field at a given transverse location across said prestressed concrete close enough to said reinforcing members that some of said magnetic field is within said reinforcing members;

obtaining an analog equivalent of said magnetic field at a given longitudinal location by means of a sensor placed in said magnetic field and recording said analog equivalent;



repeating the above steps at all points along the length of said members to produce a record of said magnetic field along the entire length of said members;

repeating the above steps at a different transverse location across said prestressed concrete; and

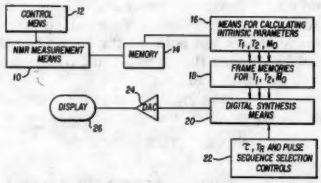
inspecting said record to detect the presence of any anomalies in it, said anomalies providing an indication of the depth of the member as well as the presence of a flaw in the member.

4,573,014

NMR IMAGING METHOD AND APPARATUS

Stephen J. Riederer, Durham, N.C., assignor to Duke University, Durham, N.C.

Filed Nov. 9, 1983, Ser. No. 550,198
Int. Cl.[4] G01R *33/20*
U.S. Cl. 324—307 **14 Claims**



14. A video processor for synthesizing and displaying images derived from NMR measurements of a body comprising

means for performing NMR measurements on a body using a predetermined pulse sequence;

control means for selectably establishing parameters controlling the characteristics of the pulse sequence including at least one of pulse delay time τ and repetition time T_R;

means for storing data from said measurements;

means for calculating from said data the intrinsic parameters for each of a matrix of pixels representative of points in the body, said parameters including at least one of spin-lattice relaxation time T_1, spin-spin relaxation time T_2 and net magnetization M_o and for storing said parameters:

means for computing and storing a value for each pixel in said matrix representative of a brightness level, each said value being derived from the intrinsic parameter values for the point, a selected pulse sequence relationship and selected parameters T_R and τ, thereby forming a matrix representing a displayable image; and

means for displaying image.

4,573,015

METHOD OF MEASURING INTERNAL INFORMATION FROM A TARGET BY USING NUCLEAR MAGNETIC RESONANCE

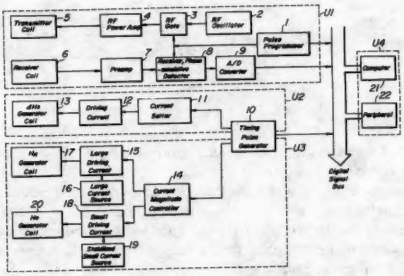
Zenwemon Abe, Yokohama; Yoshifumi Yamada, Utsunomiya, and Kunio Tanaka, Asahikawa, all of Japan, assignors to Asahikawa Medical College, Hokkaido, Japan

Filed Aug. 23, 1983, Ser. No. 525,647

Claims priority, application Japan, Aug. 31, 1982, 57-151172; Aug. 31, 1982, 57-151173

Int. Cl.[4] G01R *33/08*

U.S. Cl. 324—309 23 Claims



1. A method of selectively measuring internal information from a target, comprising the steps of

applying a step-like driving current to a static magnetic field generator which is adapted to successively produce a strong static magnetic field H_M and a weak homogeneous static magnetic field H_o in at least a part of the target in a short period of time;

applying a specifying magnetic field ΔH_s to said target so as to specify a spatial locality within the target; and

applying a high-frequency magnetic field H_1 to the target under the presence of said weak static magnetic field H_o and said specifying magnetic field ΔH_s, said high-frequency magnetic field H_1 having a nuclear magnetic resonance frequency f_o for the composite magnetic field $(H_o+\Delta H_s)$.

4,573,016

METHOD AND ARRANGEMENT FOR ENABLING THE DETECTION OF THE LOCATION OF A HORIZONTALLY ARRANGED GAS CONVEYING PASSAGE POSITIONED UNDERGROUND

Syuichi Nakamura, and Masakazu Morioka, both of Osaka, Japan, assignors to Osaka Gas Company Limited, Osaka, Japan

Division of Ser. No. 242,255, Mar. 10, 1981, Pat. No. 4,449,098. This application Feb. 3, 1984, Ser. No. 576,926

Claims priority, application Japan, Mar. 19, 1980, 55-35611

Int. Cl.[4] G01V *3/06, 3/12;* G01R *19/15*

U.S. Cl. 324—326 7 Claims

1. An arrangement for enabling the detection from above the ground of the location of a generally horizontally arranged gas conveying passage positioned beneath the ground, said arrangement comprising:

a main gas pipe positioned beneath the ground and defining a generally horizontal gas conveying passage, said main gas pipe being formed of an electrically insulative synthetic resin material;

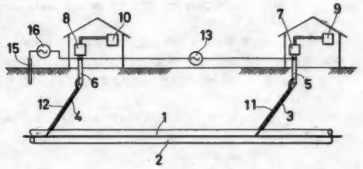
first and second branch gas pipes connected to said main gas pipe at respective longitudinally spaced positions thereof and extending therefrom upwardly, said branch gas pipes being positioned beneath the ground, and each said branch gas pipe being formed of an electrically insulative synthetic resin material;

first and second steel pipes embedded in the ground and extending upwardly therefrom, said first and second steel pipes being connected to said first and second branch gas pipes, respectively;

first and second gas burning appliances located above the ground and connected to said first and second steel pipes, respectively;

an electrically conductive wire positioned along the exterior of said main gas pipe, said wire comprising a flexible metallic core formed by stranding together a plurality of single wires and an electrically conductive flexible outer coating layer applied over said core, said layer being formed of a combination of 100 parts by weight of chloroprene rubber or natural rubber per 50 to 60 parts by weight of acetylene carbon, and said layer having a specific resistance of approximately 100 ohm-cm;

first and second electrically conductive branch wires extending along the exteriors of said first and second branch gas pipes, respectively, each said branch wire comprising



a flexible metallic core formed by stranding together a plurality of single wires and an electrically conductive flexible outer coating layer applied over said core, each said layer being formed of a combination of 100 parts by weight of chloroprene rubber or natural rubber per 50 to 60 parts by weight of acetylene carbon, and each said layer having a specific resistance of approximately 100 ohm-cm, and each said branch wire having a first end electrically connected to said wire and a second end wound around the exterior of the respective said steel pipe, with an end of said core of said second end of each said branch wire being welded to the exterior of the respective said steel pipe;

a high frequency power source positioned above the ground; and

means for supplying high frequency energy of from 2 KHz to 100 KHz at 6 volts from said power source to said first and second steel pipes, said first and second branch wires and said wire, and thereby for causing said wire to emit electromagnetic waves which are detectable from above ground, thus providing an indication of the position below ground of said main gas pipe.

4,573,017

UNITARY PHASE AND FREQUENCY ADJUST NETWORK FOR A MULTIPLE FREQUENCY DIGITAL PHASE LOCKED LOOP

Stephen N. Levine, Chicago, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Jan. 3, 1984, Ser. No. 567,724

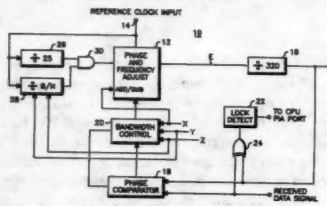
Int. Cl.[4] H03K *5/13, 5/22;* H03D *13/00*

U.S. Cl. 328—155 7 Claims

1. A phase and frequency compensation network for use in a multiple frequency digital phase-locked loop for effecting frequency adjustments in response to a programmable input signal by selectively summing or subtracting first and second clock signals' at a rate defined by a derived clock signal, said phase and frequency compensation network comprising:

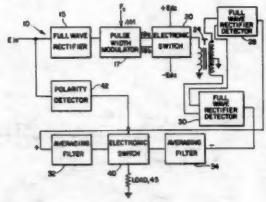
(a) first inverter means having an input coupled to said

programmable input signal indicating positive or negative frequency adjustments;
(b) first NAND gate means having first and second inputs and an output, said first input coupled to said derived clock signal and said second input coupled to said programmable input signal;
(c) second NAND gate means having first and second inputs and an output, said first input coupled to said derived clock signal and said second input coupled to the output of said first inverter means;
(d) first AND gate means having first and second inputs, and an output said first input coupled to the output of said second NAND gate means and said second input providing an input, wherein said input indicates a positive phase adjustment;
(e) second inverter means having an input and an output, said input coupled to the output of said first NAND gate means;
(f) third inverter means having an input and an output, said input coupled to the output of said second NAND gate means;
(g) first flip-flop means having delay and clock inputs and a non-inverting ourput, said delay input coupled to the output of said second inverter means and said clock input coupled to said second clock signal;
(h) second flip-flop means having delay and clock inputs and a non-inverting output, said delay input coupled to the output of said third inverter means and said clock coupled to said first clock signal;
(i) third flip-flop means having delay and clock inputs and a



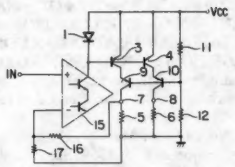
non-inverting output said delay input coupled to the output of said first AND gate means and said clock coupled to said first clock signal;
(j) second AND gate means having first and second inputs and an output, said first input coupled to the output of said first NAND gate and said second input providing an input wherein said input indicates a negative phase adjustment;
(k) fourth flip-flop means having delay and clock inputs and a non-inverting output, said delay input coupled to the output of said second AND gate and said clock input coupled to said second clock signal;
(l) NOR gate means having first and second inputs and an output, said first input coupled to the output of said second flip-flop means and said second input coupled to the output of said third flip-flop means;
(m) first OR gate means having first and second inputs and an output, said first input coupled to the output of said first flip-flop means and said second input coupled to the output of said fourth flip-flop means;
(n) third NAND gate means having first and second inputs and an output, said first input coupled to said second clock signal and said second input coupled to the output of said NOR gate means;
(o) fourth NAND gate means having first and second inputs and an output, said first input coupled to said first clock signal and said second input coupled to the output of said first OR gate means; and
(p) fifth NAND gate means having first and second inputs and an output, said first input coupled to the output of said third NAND gate means and second input coupled to the output of said fourth NAND gate means and said output comprising the output of said phase and frequency adjust network.

4,573,018
SWITCHING AMPLIFIER SYSTEM
Fred Mirow, 47 Edgewood Rd., Westwood, Mass. 02090
Filed Apr. 19, 1984, Ser. No. 602,225
Int. Cl.[4] H03F *3/38*
U.S. Cl. 330—10 **2 Claims**



1. An audio amplifier system comprising:
a source of audio input signal;
means to pulse width modulate at least one high frequency pulse train with the audio input signal
means for providing a power gain to the modulated pulse train and passing the modulated pulse train through a high frequency transformer;
means for demodulating the modulated pulse train whereby the increased magnitude of the audio input signal is recovered and for filtering the recovered signals to remove non-audio signals;
polarity detector means for providing audio signal to a load in accordance with the polarity of the input signal.

4,573,019
CURRENT MIRROR CIRCUIT
Yuji Yamada, Tokyo, Japan, assignor to Trio Kabushiki Kaisha, Tokyo, Japan
Filed Mar. 12, 1984, Ser. No. 588,818
Claims priority, application Japan, Mar. 16, 1983, 58-36980[U]
Int. Cl.[4] H03F *3/04, 3/45*
U.S. Cl. 330—257 **1 Claim**



1. A current mirror circuit comprising:
a reference current source consisting of an amplifier having a voltage input and a current output;
diode means fed with said current output from said reference current source;
a plurality of output transistors commonly biased in base-emitter by a voltage induced across said diode means and having loads at respective collectors thereof; and
load adjustment transistors disposed between the collector of the respective output transistor and the associated load and biased in the respective base by a common voltage, a voltage induced across one of said loads is negatively fed back to the input of said amplifier,

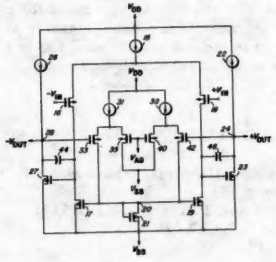
whereby a plurality of output currents having the same value being obtained in respective loads.

4,573,020

FULLY DIFFERENTIAL OPERATIONAL AMPLIFIER WITH D.C. COMMON-MODE FEEDBACK

Roger A. Whatley, Austin, Tex., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 18, 1984, Ser. No. 682,873
Int. Cl.⁴ H03F *3/16, 3/45*
U.S. Cl. 330—258 **5 Claims**



4. A fully differential operational amplifier comprising:

first, second and third current source means for providing first, second and third constant source currents;

a first transistor coupled to the second current source means, for selectively receiving a first input voltage and providing a first current in proportion thereto;

a second transistor coupled to the second current source means, for selectively receiving a second input voltage and providing a second current in proportion thereto;

a third transistor having a current electrode coupled to the first transistor, and a control electrode, said third transistor sinking the first current in proportion to a third current;

a fourth transistor having a current electrode coupled to the second transistor, and a control electrode, said fourth transistor sinking the second current in proportion to the third current;

a fifth transistor having a control electrode coupled to the third transistor, a first current electrode connected to the first current source at a first output terminal, and a second current electrode connected to a power supply terminal, for providing a first output voltage in proportion to the difference between the first and second currents;

a sixth transistor having a control electrode coupled to the fourth transistor, a first current electrode connected to the third current source at a second output terminal, and a second current electrode connected to the power supply terminal, for providing a second output voltage in proportion to the difference between the first and second currents; and

common mode feedback means coupled to the control electrodes of the third and fourth transistors, for providing the third current in proportion to changes in the sum of the first and second output voltages relative to a reference voltage.

4,573,021

CIRCUIT OUTPUT STAGE ARRANGEMENT

Robert J. Widlar, Apartado Postal 541, Puerto Vallarta, Jalisco, Mexico

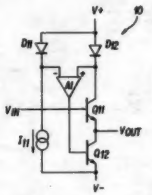
Filed Mar. 22, 1984, Ser. No. 592,150
Int. Cl.⁴ H03F *3/26*
U.S. Cl. 330—273 **29 Claims**

1. A circuit output stage, comprising:

a first output transistor wherein an input to the circuit is to be applied to the base of said first output transistor;

a second output transistor having its collector connected to the emitter of said first output transistor wherein an output from the circuit is to be taken from the junction of said collector and emitter;

a first diode means for sensing the current flow in the collector of said first output transistor; and



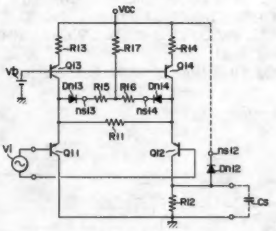
a circuit means for establishing a quiescent operating current level of said first output transistor and said circuit means having an output that is to be applied to the base of said second output transistor for preventing the output of said first output transistor from falling substantially below said quiescent operating current level wherein the output of said circuit means is dependent upon the current sensed by said first diode means.

4,573,022

SEMICONDUCTOR INTEGRATED CIRCUIT USING VERTICAL PNP TRANSISTORS

Takashi Koga, Fukaya, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Dec. 13, 1984, Ser. No. 681,142
Claims priority, application Japan, Dec. 17, 1983, 58-238669; Dec. 17, 1983, 58-238670
Int. Cl.⁴ H03F *3/14, 3/45*
U.S. Cl. 330—307 **13 Claims**

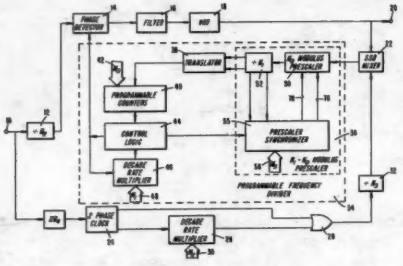


1. A semiconductor integrated circuit comprising a vertical PNP transistor having a collector, an emitter, and a base in which said transistor has its emitter coupled to a power source and its collector coupled to a load resistance and its base connected to receive an input signal, and a parasitic diode has its anode coupled to the collector of said transistor and its cathode coupled to said power source, characterized in that a direct-current transmission element having an impedance which is appreciably higher than the resistance value of said load resistor is connected between the cathode of said parasitic diode and said power source.

4,573,023
MULTIPLE-MULTIPLE MODULUS PRESCALER FOR A PHASE-LOCKED LOOP

Steven P. Cok, and Eric R. Drucker, both of Seattle, Wash., assignors to John Fluke Mfg. Co., Inc., Everett, Wash.

Filed Aug. 7, 1984, Ser. No. 638,631
Int. Cl.[4] H03L 7/18; H03K 21/00
U.S. Cl. 331—1 A 8 Claims

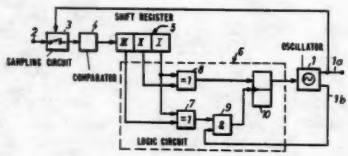


8. A method of frequency synthesis comprising:
setting a desired frequency;
setting a divider using said desired frequency to produce a divided signal by dividing selectively during alternate first and second time periods (1) by a first modulus for said first time period and said first modulus for said second time period, (2) by said first modulus for said first time period and a second modulus for said second time period, and (3) by said second modulus for said first time period and said second modulus for said second time period, depending upon the desired frequency and signals developed by said divider;
detecting a phase difference between said divided signal and a reference signal and outputting a control signal proportional thereto; and
modifying an oscillator output frequency until said control signal is eliminated and said output frequency equals said desired frequency.

4,573,024
PLL HAVING TWO-FREQUENCY VCO

Bengt R. Carlqvist, Bromma, Sweden, assignor to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden

PCT No. PCT/SE82/00399, § 371 Date Jul. 22, 1983, § 102(e) Date Jul. 22, 1983, PCT Pub. No. WO83/02045, PCT Pub. Date Jun. 9, 1983
PCT Filed Nov. 25, 1982, Ser. No. 522,162
Int. Cl.[4] H03L 7/06
U.S. Cl. 331—1 A 3 Claims

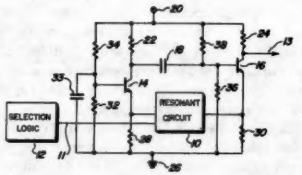


1. A periodic signal generator synchronized to an incoming signal whose amplitude continuously varies at a frequency fi comprising: a signal controlled oscillator means for generating either a first signal periodically varying at a first frequency greater than but in the neighborhood of four times the frequency fi in response to the receipt of a first value of a binary signal or a second signal periodically varying at a second frequency less than but in the neighborhood of four times the frequency fi in response to the receipt of a second value of said binary signal; sampling means responsive to said oscillator means periodically sampling the incoming signal for generating for each sampling instant a signal having a first level or a second level dependent on whether the incoming signal at the time of sampling is greater or less than a given voltage level said sampling means comprising a sampling circuit for periodically sampling the incoming signal and comparator for comparing the samples with a given reference voltage level; shift register storage means responsive to said sampling means for storing a set of said signals having the first and second levels; and logic means responsive to said oscillator means to periodically sample said shift register storage means for generating said first or second value of said binary signal in accordance with particular given relationships among the levels of the signals stored in said shift register storage means.

4,573,025
DRIFT-EQUALIZED, MULTI-FREQUENCY OSCILLATOR

William E. McKinzie, III, Mesa, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Apr. 2, 1984, Ser. No. 595,841
Int. Cl.[4] H03B 5/18
U.S. Cl. 331—117 D 10 Claims



1. A frequency switchable oscillator having a frequency of oscillation relative to an oscillator ground, said frequency being selected from a predetermined number of discrete frequencies, said oscillator comprising:
a. a resonant circuit having
1. a predetermined number of reactive impedance paths for determining each frequency of oscillation from the predetermined number of discrete frequencies,
2. a first PIN diode, having forward and reverse biased modes, the first diode coupled to one of the reactive impedance paths so that when the first diode is in the reverse bias mode the first diode electrically removes the one of the reactive impedance paths from said resonant circuit,
3. a selective energizing section for energizing the first PIN diode in the forward biased mode so that the one of the reactive impedance paths coupled to the first diode is electrically coupled into said resonant circuit through the first diode when the first diode is in the forward biased mode and so that the one of the reactive impedance paths coupled to the first diode substantially influences the frequency of oscillation of the oscillator,
4. means, coupled to the first PIN diode and coupled to the selective energizing section, for isolating the one of said reactive impedance paths connected to said first PIN diode from the selective energizing section and from oscillator ground, and for providing biasing current to said first PIN diode, and
5. a crystal, having a natural resonant frequency, the crystal coupled to the plurality of reactive impedance paths so that the crystal is an integral portion of each of the reactive impedance paths;
b. means, coupled to said resonant circuit, for amplifying the oscillation; and
c. selection logic, coupled to the selective energizing means

of said resonant circuit, for providing a selection signal which causes the oscillator to oscillate at one of the predetermined frequencies.

4,573,026

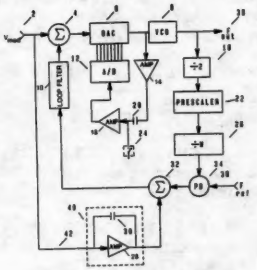
FM MODULATOR PHASE-LOCKED LOOP WITH FM CALIBRATION

G. Stephen Curtis, Spokane, and David P. Whipple, Greenacres, both of Wash., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Feb. 29, 1984, Ser. No. 584,668

Int. Cl.[4] H03C *3/08, 3/20;* **H03L** *7/06;* **H04B** *1/00*

U.S. Cl. 332—18 **9 Claims**



1. An electronic apparatus for calibrated frequency modulation of a multiplicity of frequencies which are desired multiples of a reference frequency generated in a phase-locked loop, said apparatus comprising:

frequency generating means for producing an output signal with a frequency determined by the level of a control input signal;

counting means coupled to the output of the frequency generating means for producing an output signal having a frequency equal to the frequency of the signal at the input of the counting means divided by N;

phase comparison means coupled to the counting means for comparing the phases of the output signal from the counting means and the reference signal, and generating an error signal indicative of a phase difference therebetween, said error signal serving as the control input signal to the frequency generating means to thereby control the frequency of the output signal from the frequency generating means;

input summing means coupled to the output of the phase comparison means and to the input of the frequency generating means for summing a frequency modulation signal with the control input signal for producing frequency modulation of the output signal from the frequency generating means;

frequency change means coupled to the counting means, responsive to a frequency step change signal, for changing the frequency of the input signal to the counting means thereby forcing the phase-locked loop to step change the frequency of the frequency generating means output signal by a multiple of the reference signal frequency;

sampling means coupled to the input of the frequency generating means for detecting a change in the control input signal and providing an output signal linearly proportional to said change in the control input signal; and

amplitude adjustment means coupled to the sampling means and responsive to the output of the sampling means for adjusting the amplitude of the control input signal, said adjustment of the amplitude of the control input signal being proportional to the output of the sampling means.

4,573,027

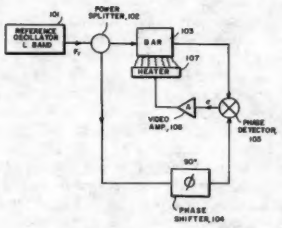
BULK ACOUSTIC RESONATOR TRACKING FILTER

Michael S. Buchalter, Laurel; Francis W. Hopwood, Severna Park, and James T. Haynes, Pasadena, all of Md., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed May 30, 1984, Ser. No. 615,502

Int. Cl.[4] H03G *11/04;* **H03H** *9/00*

U.S. Cl. 333—17 R **1 Claim**



1. In combination with a Bulk Acoustic Resonator which receives incoming signals over an input terminal, and produces response signals over an output terminal, and in combination with a signal source having an output terminal and producing said incoming signals over its output terminal, a frequency mobile filter which receives and conducts said incoming signals from the output terminal of said signal source to the input terminal of the Bulk Acoustic Resonator, said frequency mobile filter dynamically heating said Bulk Acoustic Resonator to thermally adjust its response signals so that frequencies of said response signals match frequencies of said incoming signals, said frequency mobile filter comprising:

a first and second positive voltage source;

a negative voltage source;

a power splitter having an input terminal and first and second output terminals, said power splitter receiving said incoming signals on its input terminal from the output terminal of said signal source, said power splitter producing first and second split signals respectively over its first and second output terminals by splitting said incoming signals, said first output terminal conducting said first split signals to the input terminal of said Bulk Acoustic Resonator;

a phase shifter having an input and output terminal, said phase shifter receiving said second split signals on its input terminal from the second output terminal of said power splitter, said phase shifter producing phase shifted signals over its output terminal by shifting said second split signals by ninety degrees;

a phase detector having first and second input terminals and an output terminal, said phase detector receiving said phase shifted signals on its first input terminal from said output terminal of said phase shifter, said phase detector receiving said response signals on its second input terminal from the output terminal of said Bulk Acoustic Resonator, said phase detector outputting an error signal over its output terminal when said response signals of said Bulk Acoustic Resonator are not centered at the frequency of said phase shifted signals, said error signal indicating any amount of mismatch between the frequencies of said phase shifted signals and said response signals;

an operational amplifier having an inverting input terminal, a noninverting input terminal, and an output terminal, said operational amplifier receiving said error signal on its noninverting input terminal and producing an amplified error signal on its output terminal;

a first resistor conducting said error signal from the output terminal of said phase detector into the noninverting input terminal of said operational amplifier;

a second resistor connecting said operational amplifier's inverting input terminal with a common electrical ground;

a capacitor connected to the output terminal of said operational amplifier;

a third resistor connecting said capacitor in series with said operational amplifier's inverting input terminal;

a first diode having a first and a second terminal, said first diode being forward biased from its first terminal to its second terminal, said first diode having its first terminal connected with said operational amplifier's noninverting input terminal;

a fourth resistor connecting the second terminal of said first diode with said first positive voltage source, said fourth resistor being connected to said second terminal of said first diode by a junction between said fourth resistor and said first diode;

a fifth resistor connecting the junction between said fourth resistor and said first diode with said operational amplifier's output terminal;

a second diode having a first and second terminal, said second diode being forward biased from its first terminal to its second terminal, said second diode having its second terminal connected with said operational amplifier's inverting input terminal;

a sixth resistor connecting said second diode's first terminal with said operational amplifier's output terminal, said sixth resistor being connected to said first terminal of said second diode by a junction between said sixth resistor and said second diode;

a seventh resistor connecting the junction between said second diode and said sixth resistor with said negative voltage source;

a eighth resistor connected with said operational amplifier's output terminal;

a heater having an input terminal which is electrically connected to the output terminal of said operational amplifier by said eighth resistor, said heater receiving said amplified error signal on its input terminal, said heater heating said Bulk Acoustic Resonator at amounts varying with said amplified error signal, said heater thereby thermally adjusting said response signals of said Bulk Acoustic Resonator to match the frequencies of said incoming signals by applying more heat when said amplified error signal indicates that the frequency of said response signals need to be increased to match that of said incoming signals, said heater applying less heat when said error signals indicate the frequency of said response signals need to be decreased to match that of said incoming signals; and

a ninth resistor connecting the junction between said eighth resistor and said input terminal with said second positive voltage source.

4,573,028

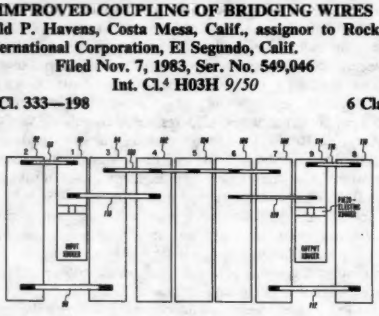
MECHANICAL FILTER APPARATUS HAVING INTERCHANGED RESONATOR MEANS FOR IMPROVED COUPLING OF BRIDGING WIRES

Donald P. Havens, Costa Mesa, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Nov. 7, 1983, Ser. No. 549,046

Int. Cl.⁴ H03H *9/50*

U.S. Cl. 333—198 **6 Claims**



1. The method of reducing flexural spurious mode problems in acoustic bridging wires used in modifying the response characteristics of a section of a resonator type mechanical filter including input and output resonators comprising the steps of:

arranging the physical position of at least one input and output resonators of a resonator type mechanical filter including a plurality of acoustically intermediate resonators whereby distances between resonators to be acoustically bridged are reduced as compared to the physical equivalent series acoustical coupling distance between the resonators to be bridged;

acoustically coupling the resonators including those that are not physically adjacent using coupling wires; and

acoustically coupling the input and output resonators of the filter to predetermined other resonators using bridging wires whereby the physical layout of the resonators given designators 1 to n from one end point to an opposing end point of the filter will not correspond to the passage of electrical signals from input to output through the resonators of the filter.

4,573,029

SWITCH DEVICE

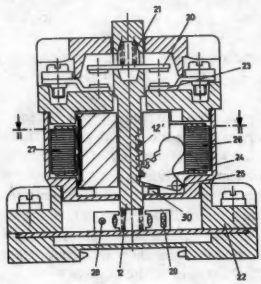
Hubert L. Naimer, Nuvola Bianca, Ascona, Switzerland CH-6612, and Gottfried Alsch, Genarogasse 5, Vienna, Austria A-1232

Filed Apr. 10, 1984, Ser. No. 598,782

Claims priority, application Austria, Apr. 25, 1983, 1496/83

Int. Cl.⁴ H01H *67/06*

U.S. Cl. 335—122 **3 Claims**



1. A switch device for opening and closing an electrical circuit, which comprises

(a) switch members movable in an operating direction for opening and closing the circuit,

(b) solenoid drive means for moving the switch members in the operating direction, the solenoid drive means comprising

(1) an armature having an operating movement which is substantially normal to the operating direction of the switch members and

(2) a core,

(c) a push rod whereto the switch members are coupled for movement therewith, the push rod comprising

(1) a gear rack, and

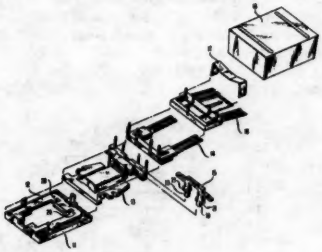
(d) a pinion segment meshing with the gear rack, the push rod and the pinion segment being located between said armature and said core and being surrounded thereby, the pinion segment being pivotal about an axis extending transversely to the push rod and being engaged by the armature, the operating movement of the armature pivoting the pinion segment and moving the push rod and switch members coupled thereto in the operating direction.

4,573,030

SEALED RELAY STRUCTURE

Rudolf Schubert, Reynoldsburg, Ohio, assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Dec. 29, 1983, Ser. No. 566,653
Int. Cl.[4] H01H 7/16, 1/66
U.S. Cl. 335—156 7 Claims



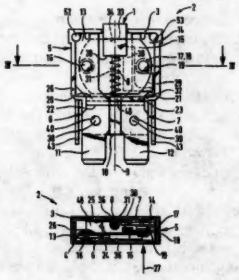
1. A relay device comprising at least one sealed volume, said sealed volume comprising at least one electrical contact, operating card and armature each having a rubbing operating surface characterized in that the sealed volume further comprises catalytic metal capable of catalyzing the polymerization of organic matter into a solid polymer said catalytic metal located on the rubbing operating surface either on the operating card or armature.

4,573,031

PUSH BUTTON-ACTUATED OVERLOAD PROTECTIVE CIRCUIT BREAKER

Fritz Krasser, Altdorf, Fed. Rep. of Germany, assignor to Ellenberger & Poensgen GmbH, Altdorf, Fed. Rep. of Germany

Filed Nov. 1, 1984, Ser. No. 667,223
Claims priority, application Fed. Rep. of Germany, Nov. 22, 1983, 3342144
Int. Cl.[4] H01H 71/16
U.S. Cl. 337—68 14 Claims



1. A push-button actuated overload circuit breaker with bimetal cutoff, comprising

(a) a housing having sidewalls bearing internal surfaces and an interior space therein;

(b) a first and a second contact element being held in position between said sidewalls,

(c) a push button and

(d) a pressure spring cooperating with said push button, said push button being guided in said housing for longitudinal displacement therein,

said contact elements having each a prong-shaped end, protruding from said housing,

said prong-shaped ends being arranged in parallel with each other, said contact elements further having each a mounting end portion adapted for being located in the interior of said housing and a central region adjacent said mounting portion and having a step-like bend therein,

said bend being of a height amounting to approximately half the height of the interior space, said height of said interior space being the shortest distance between opposite sidewalls in said housing, the bend of each of said contact elements being such that said mounting end portions rest between, and in contact with, two opposite ones of said internal surfaces of said housing sidewalls;

(e) a bimetal snap disc having a fastening end and an opposite slewable end and extending between said fastening end and said slewable end thereof in a direction transverse to the direction of longitudinal displacement of said push button, said bimetal snap disc being fastened with said fastening end thereof to the mounting portion of said first contact element;

said slewable end of said bimetal snap disc overlapping said mounting end portion of said second contact element, and being urged by said pressure spring into contact with said lastmentioned mounting end portion, when the circuit breaker is in unactuated closed position;

said push button comprising

(f) an innermost end located inside said housing and

(g) a separating wall protruding laterally on one side from the region of said innermost push button end and having a rim portion turned toward said push button;

said bimetal snap disc having a lateral projection, said rim portion of said separating wall adapted for engaging said lateral projection of said disc with bias applied thereto by said pressure spring, when said bimetal snap disc is in nonexcited state; and

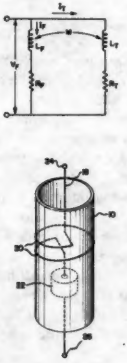
(h) contactor means on said second contact element, said separating wall being adapted for introduction between said slewable end of said bimetal snap disc and said second contact element contactor means with bias applied thereto by said pressure spring, when said bimetal snap disc is in excited, upwardly bent state.

4,573,032

INDUCTIVELY COMPENSATED TRIGGER CIRCUIT FOR A CHEMICALLY AUGMENTED FUSE

John S. Hickey, Burnt Hills, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Jan. 5, 1984, Ser. No. 568,330
Int. Cl.[4] H01H 85/04, 37/76
U.S. Cl. 337—162 13 Claims



1. A chemically augmented fuse comprising:

a trigger conductor;

exothermic material disposed adjacent to said trigger conductor, with said material being responsive to current flow in said trigger conductor so that a chemical reaction is initiated in said material in response to a predetermined level of current in said trigger conductor; and

a fuse conductor disposed adjacent to said exothermic material,

said trigger conductor comprising at least one loop of electrically conductive material disposed so as to be inductively coupled to the magnetic field generated by current flow through said fuse conductor, so that the effective inductance of said trigger conductor is increased by said inductive coupling.

4,573,033

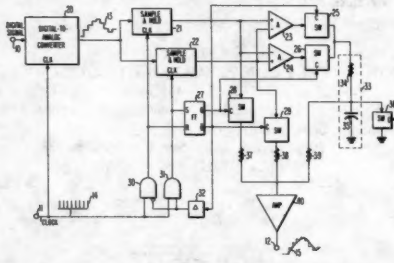
FILTER CIRCUIT FOR DIGITAL-TO-ANALOG CONVERTER

Louis Kolodin, Cherry Hill, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Jul. 18, 1983, Ser. No. 514,952

Int. Cl.[4] H03K *13/02*

U.S. Cl. 340—347 DA **24 Claims**



14. A digital-to-analog signal conversion system comprising:

a digital-to-analog (D/A) converter providing an output signal comprising a succession of voltage levels with each voltage level occurring in a corresponding time period;

means responsive to said converter output signal for amplifying a voltage which is the difference between said converter output signal voltage level occurring during one time period and the voltage level of said converter output signal of the next preceding time period, the gain of said amplifying means being substantially greater than unity;

means for integrating the output signal of said amplifying means, said integrating means having a time constant which is related to said gain of said amplifying means and the duration of said time period, said time constant being substantially greater than the time duration of said time period; and

means for summing the output signal of said integrating means with the voltage level of said converter output signal of said next preceding time period.

4,573,034

METHOD OF ENCODING N-BIT INFORMATION WORDS INTO M-BIT CODE WORDS, APPARATUS FOR CARRYING OUT SAID METHOD, METHOD OF DECODING M-BIT CODE WORDS INTO N-BIT INFORMATION WORDS, AND APPARATUS FOR CARRYING OUT SAID METHOD

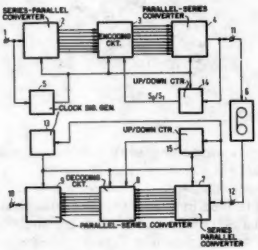
Kornelis A. Schouhamer Immink, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 29, 1984, Ser. No. 676,467

Claims priority, application Netherlands, Jan. 20, 1984, 8400187; Aug. 8, 1984, 8402445

Int. Cl.[4] H03K *13/24*

U.S. Cl. 340—347 DD **20 Claims**



1. A method of encoding n-bit information words belonging at least to a first group, into m-bit code words belonging to a first group, where $m > n$, within which code words the variation of the digital sum value of said code words relative to the initial value of the digital sum value of said code words is limited to a value corresponding to the variation of a first binary value over p bits and a value corresponding to the variation of a second binary value over q bits, where $p \geqq 0$ and $q \geqq 0$, and which code words exhibit a disparity d, d being an integer within the limits defined by p and q, characterized in that said code words are found by the use of a series of encoding numbers which correspond unambiguously to the information words of the first group, and of numbers $x_{k,r}$ which can be found by arranging the number in a matrix, k being a sequence number for the columns ranging from 1 to $p+q+1$ inclusive and r being a sequence number for the rows ranging from 1 to m inclusive, which matrix can be formed by entering the value 1 in the 1st row and the $(p+d+2)$nd column ($x_{p+2+d,1}=1$), filling the 1st column with the values 0 ($x_{1,r}=0$), and adding an auxiliary column with the sequence number $p+q+2$ and filling said auxiliary column with the value in the column $p+q+1$ in the row of next lower sequence number ($x_{p+q+2,r}=x_{p+q+1,\,r-1}$) and filling the other relevant positions with the sum of the values in the adjacent columns in the row of next lower sequence number ($x_{k,r}=x_{k-1,\,r-1}+x_{k+1,\,r-1}$) with the proviso that the vacant positions at the first row are assumed to be filled with a value zero, all the values on the diagonal which extends from the number $x_{p+1,\,m}$ to the number $x_{1,\,m-p}$ being modifiable by the same constant value, in which starting from a number $x_{k,r}$ with a row sequence number $r=m$ and with a column sequence number $k=p+1$ and starting from an initial value of an auxiliary number A, which initial value corresponds to the encoding number associated with the information word to be encoded of the first group, said auxiliary number is compared with the number $x_{k,r}$ with the instantaneous row sequence number r and column sequence number k to modify said auxiliary number if said number $x_{k,r}$ is smaller than or equal to the auxiliary number A, by subtracting said number $x_{k,r}$ ($A:=A-x_{k,r}$) and to generate one bit of the second binary value, and to select a following number $x_{k,r}$ with a row sequence number decremented by one ($r:=r-1$) and a column sequence number incremented by one ($k:=k+1$), and to leave said auxiliary number unmodified, if said number $x_{k,r}$

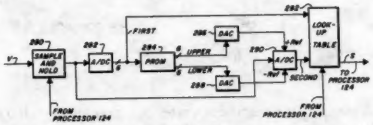
is larger than the auxiliary number, to generate one bit of the first binary value and to select a following number $x_{k,r}$ with a row sequence number decremented by one (r:=r−1) and a column sequence number decremented by one (k:=k−1), until finally the row sequence number r=1 is reached, after which a bit of the second binary value is generated if the auxiliary number is zero and a bit of the first binary value if the auxiliary number is one, the m bits generated for each information words constituting the code word.

4,573,035

DIGITAL X-RAY SYSTEM

Enrico Dolazza, Boston, Mass., assignor to Analogic Corporation, Peabody, Mass.

Filed Jul. 25, 1984, Ser. No. 634,398
Int. Cl.⁴ H03M *1/08, 1/70*
U.S. Cl. 340—347 AD **2 Claims**



1. A digitization system comprising:

means for providing an analog data signal including a noise component of known noise behavior as a function of the magnitude of the analog data signal; and

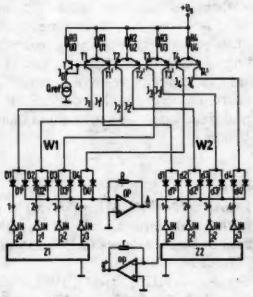
an analog to digital converter receiving said analog data signal having a digitization interval adapted to correspond to the noise behavior of said analog data signal noise component to provide a digital signal having a selected entropy uniformly related to the information content of the received analog data signal throughout the dynamic range of the signal.

4,573,036

INTEGRABLE CIRCUIT FOR DIGITAL-TO-ANALOG CONVERTER

Jürgen Wondra, Neubiberg, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Dec. 9, 1982, Ser. No. 448,221
Claims priority, application Fed. Rep. of Germany, Dec. 10, 1981, 3148956
Int. Cl.⁴ H03M *1/00*
U.S. Cl. 340—347 DA **10 Claims**



1. In an integrable digital/analog converter arrangement including at least two digital/analog converter circuits each including:

a plurality of inputs for a digital input signal to be converted into an analog output signal, said inputs corresponding in number to the number of bits of said digital input signal,

a plurality of first diodes each connected with a first terminal to a corresponding one of said inputs,

an equal plurality of second diodes which are mutually identical with said first diodes, a second terminal of each of said first diodes being connected to a second terminal of a corresponding one of said second diodes and the first terminals of said second diodes being commonly connected to

an input of an output amplifier for providing said analog output signal, and

a plurality of digitally weighted current sources each comprising a current source transistor, said transistors all being of the same type, and a plurality of resistors each having first and second terminals, wherein current input terminal of each one of said current source transistors are respectively connected to the first terminal of the corresponding one of said resistors, the second terminals of said resistors being commonly connected to a common power supply terminal, and the current output terminals of said current source transistors being connected to corresponding second terminals of said first diodes and to corresponding second terminals of said second diodes,

the improvement comprising that

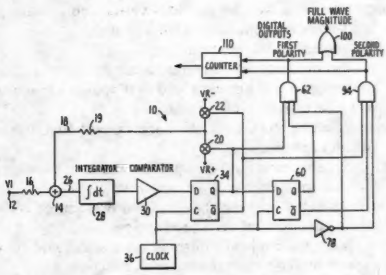
said current input terminals of the corresponding current source transistors of said at least two digital/analog converter circuits are commonly connected to said power supply terminal via a corresponding one of said resistors.

4,573,037

ANALOG-TO DIGITAL CONVERTER AND METHOD

Michael A. Robinton, Palo Alto, and Alan H. Starkie, San Jose, both of Calif., assignors to Robinton Products, Inc., Sunnyvale, Calif.

Filed Aug. 1, 1983, Ser. No. 518,832
Int. Cl.⁴ H03K *13/02*
U.S. Cl. 340—347 NT **21 Claims**



1. A converter for producing a digital signal indicative of the magnitude and polarity of an analog input signal comprising:

clock means for producing a clock signal which occurs at clock times, separated by predetermined clock intervals;

modulating means for producing a modulated signal changeable between first and second levels at said clock times and with the time ratio of said modulated signal at said first level to said second level, referred to as a measured duty cycle value, being indicative of the magnitude of said input signal with respect to a reference level; and

output means for determing the polarity of said input signal with respect to said reference level by sampling said modulated signal at least once every said clock interval, and for producing at least one said digital signal indicative of magnitude and polarity in response to said modulated signal and said polarity determination and wherein said output means assigns a first polarity to said input signal

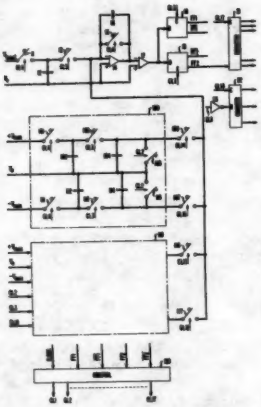
when said modulated signal is at said first level for at least two consecutive said clock intervals and a second polarity when said modulated signal is at said second level for at least two consecutive said clock intervals.

4,573,038

LINEAR CODEC WITH DUAL DIVIDER

Robert L. Carbrey, Boulder, Colo., assignor to AT&T Information Systems, Inc., Holmdel, N.J.

Filed Feb. 23, 1984, Ser. No. 582,901
Int. Cl.[4] H03K *13/02*
U.S. Cl. 340—347 C 5 Claims



1. A binary reference voltage generator for iteratively developing a progression of reference voltages with each reference voltage being one half the previous voltage comprising:

a first source capacitor for storing charges;

a first reference-charge capacitor;

first switch means for distributing the charges of said first source capacitor between said first source capacitor and said first reference-charge capacitor;

second switch means for discharging said first reference-switch capacitor;

third switch means for accessing and drawing the charge of said first reference-charge capacitor;

fourth switch means for charging said first source capacitor at the beginning of each progression;

first means for cyclically turning on and off said first and second switch means during each iteration;

means for applying a positive maximum reference voltage to said first source capacitor;

a second source capacitor for storing charges;

a second reference-charge capacitor;

fifth switch means for distributing the charges of said second source capacitor between said second source capacitor and said second reference-charge capacitor;

sixth switch means for discharging said second reference-charge capacitor;

seventh switch means for accessing and drawing the charge of said second reference-charge capacitor;

eighth switch means for charging said second source capacitor;

second means for cyclically turning on and off said fifth and sixth switch means; and

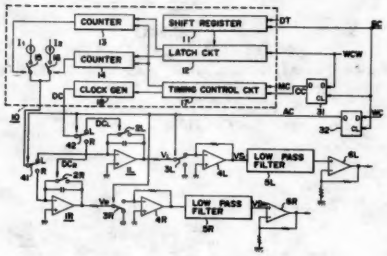
second means for applying a negative maximum reference voltage to said second source capacitor, equal in magnitude to said positive maximum reference voltage.

4,573,039

DIGITAL TO ANALOG CONVERTER

Tadao Suzuki, Tokyo, and Miki Abe, Yokohama, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Oct. 5, 1982, Ser. No. 432,845
Claims priority, application Japan, Oct. 8, 1981, 56-160506
Int. Cl.[4] H03K *13/02*
U.S. Cl. 340—347 DA 12 Claims



8. A digital to analog converter for converting alternately supplied first and second channel digital data words to first and second channel analog output signals, comprising:

current producing means common to said first and second channel digital data words for alternately producing currents of changing magnitudes and durations corresponding to said first and second channel digital data words, respectively;

first and second channel voltage producing means for producing said first and second channel analog output signals, respectively in response to the magnitudes and durations of said currents corresponding to said first and second channel digital data words, each of said first and second channel voltage producing means including integrating means for producing an integrated voltage in response to said current produced by said current producing means, reset switch means coupled to said integrating means for resetting said integrated voltage to a predetermined level, gate switch means for gating said integrated voltage from said integrating means, first low pass filter means coupled to said gate switch means for producing a filtered integrated voltage, line amplifier means coupled to said first low pass filter means for amplifying said filtered integrated voltage, second low pass filter means coupled to said line amplifier means, and second integrator means coupled to said second low pass filter means for supplying a D.C. feedback signal to said gate switch means; and

switch means disposed between said current producing means and said first and second channel voltage producing means for selectively supplying each said current corresponding to one of said first channel digital data words to said first channel voltage producing means and each said current corresponding to one of said second channel digital data words to said second channel voltage producing means.

4,573,040

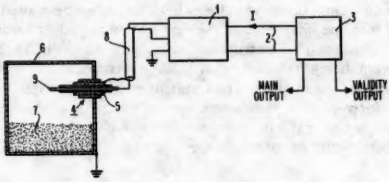
FAIL-SAFE INSTRUMENT SYSTEM

Frederick L. Maltby, Jenkintown, and L. Jonathan Kramer, Warminster, both of Pa., assignors to Drexelbrook Engineering Company, Horsham, Pa.

Continuation of Ser. No. 419,127, Sep. 17, 1982, abandoned. This application Feb. 11, 1985, Ser. No. 700,672
Int. Cl.[4] G08B *29/00*; G01R *11/52*
U.S. Cl. 340—511 12 Claims

1. An admittance-responsive two-wire instrument system comprising a power supply and a receiver in one location, an active transmitter and an admittance-sensitive probe in another location, said probe being operatively connected to said trans-

mitter, and a pair of signal wires connecting the transmitter with the receiver to form a loop, wherein the transmitter comprises means responsive to the admittance sensed by said probe for controlling the current in the loop independent of the resistance of the loop, said means for controlling being adapted to control the current to take values falling within at least one first predetermined current range within a second larger predetermined current range, said second current range not including the short and open circuit currents in said loop, and wherein the receiver comprises means for distinguishing between currents in the loop falling within the at least one first range, currents within the second larger current range but outside of the at least one first range, and the short and open circuit currents in said loop.

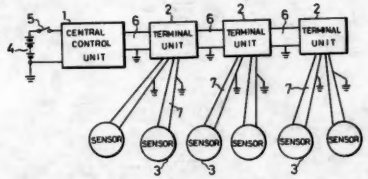


4,573,041

ELECTRIC WIRING SYSTEM HAVING A PLURALITY OF SENSORS

Junji Kitagawa; Sigeyuki Akita, and Kouichi Yamanoue, all of Okazaki, Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed Mar. 8, 1984, Ser. No. 587,656
Claims priority, application Japan, Mar. 9, 1983, 58-38711
Int. Cl.[4] G08B *1/08;* H04Q *7/00*
U.S. Cl. 340—538 **13 Claims**



12. An electric wiring system comprising:

a terminal unit;

a plurality of sensors connected to said terminal unit by a signal input line;

central control unit means, connected to said terminal unit for receiving signals from said sensors therethrough;

power supply means for connecting said terminal to said control unit means and for carrying power thereinbetween;

said central control unit means further comprising means for;

(1) generating a reference signal composed of a train of pulses, a predetermined number of said pulses being assigned to each of said sensors,

(2) applying said reference signal to said power supply lines,

(3) receiving a composite signal generated by said terminal unit from said power supply line, and

(4) determining output conditions of said sensors based on the presence and absence of high-frequency pulses in said composite signal; and

said terminal unit further comprising means for:

(1) picking up said reference signal from said power supply lines,

(2) generating a composite signal by adding said high-frequency pulses at pulse positions corresponding to said pulses of said reference signal assigned to said sensors, depending on said output conditions of said sensors, and

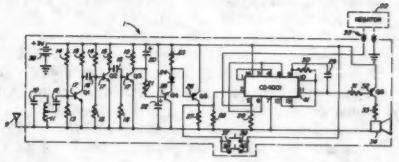
(3) applying said composite signal to said power supply lines.

4,573,042

ELECTRONIC ARTICLE SURVEILLANCE SECURITY SYSTEM

Robert C. Boyd, Scottsdale, and Charles L. La Patra, Chandler, both of Ariz., assignors to Sensormatic Electronics Corporation, Boca Raton, Fla.

Filed Mar. 14, 1983, Ser. No. 474,966
Int. Cl.[4] G08B *1/08, 13/14*
U.S. Cl. 340—539 **23 Claims**



8. Portable apparatus for releasable attachment to articles subject to surveillance comprising:

(a) attachment means for effecting such releasable attachment of said apparatus to an article and including an electrical circuit element having first and second states corresponding respectively to attachment thereof to said article and to release thereof from such attachment;

(b) alarm means operable for generating an output indicative of an alarm condition;

(c) control circuit means connected to said alarm means and to said attachment means for response to said attachment means second state for operating said alarm means to generate said output indicative of an alarm condition; and

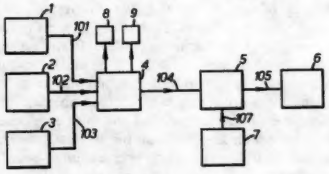
(d) negator means for connection to said control circuit means for removing said alarm means from such generation of said alarm condition.

4,573,043

SAFE GUARDED LOCKABLE CONTAINER, PARTICULARLY FOR TRANSPORTING MONEY AND SECURITIES

Johannes G. J. Heuker of Hoek, Hillegom; Cornelis J. Clement, Dordrecht, and Ernst M. van der Lee, Reeuwijk, all of Netherlands, assignors to Captor Holding B.V., The Hague, Netherlands

Filed Jun. 20, 1983, Ser. No. 505,987
Int. Cl.[4] G08B *13/14*
U.S. Cl. 340—571 **25 Claims**



1. Alarm producing apparatus including a lockable container

for safeguarding said container when delivered by a messenger, comprising in combination:

(a) alarm signal activating means for producing an activating signal to actuate at least one alarm means in independent response to (1) a zero instant signal received from a time countdown means; or (2) a status change signal received from a status detection means;

(b) said status detection means producing said status change signal at any time a change in status occurs in any respective condition monitored for said container;

(c) said time countdown means adapted to proceed to said zero instant signal only when concurrently receiving (1) at least one status locking signal produced by at least one status locking detection means interconnected to monitor the continuing proper condition of said container established prior to starting said time countdown means; (2) a time signal produced by a time setting means adapted to activate said time countdown means for a prescribed time period; and (3) a time base signal produced by a time base means adapted to produce a signal of frequency prescribed to cause said time countdown means to count down said time period in decrements of time corresponding to said frequency; and

(d) said alarm apparatus being adapted to give no alarm during said prescribed time period unless (1) said countdown means proceeds to the zero instant signal without being stopped manually as when delivery is completed; (2) a change in status occurs in at least one of said status detection means as may be caused by a change in conditions established to assure proper delivery of said container.

4,573,044

TWO CHANNEL LOOPED COMMUNICATION SYSTEM HAVING REROUTING AND FOLDED LOOP CAPABILITIES

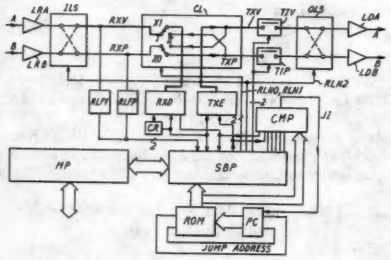
Malcolm A. McConachie, Reading, and John Rance, Newbury, both of England, assignors to Racal-Milgo Limited, Berkshire, England

Filed Jan. 21, 1983, Ser. No. 459,915

Claims priority, application United Kingdom, Feb. 8, 1982, 8203503

Int. Cl.⁴ H04Q *9/00*; H04J *3/14*

U.S. Cl. 340—825.05 **17 Claims**



1. A communication system comprising a first station and a plurality of further stations, two communication channel, for transmission in opposite directions, serially connecting the stations, the first station including first routing means selectively operable in a non-fault mode and a fault mode, the non-fault mode being a double looped mode in which the first routing means route signals received on each channel onto the respective other channel and the fault mode being a through mode in which the first routine means forward, in the same channel, signals received on each channel, each further stations including second routing means selectively operable in a non-fault mode and a fault mode, the non-fault mode being a through mode in which the second routing means forward, in the same channel, signals received on each channel, the fault mode being a looped mode in which signals received on one channel are routed on to the other channel, the communication system normally operating with all stations in their non-fault modes, whereby a single folded transmission path is formed, each further station including means for monitoring the presence of signalling energy in each channel, the routing means therein being responsive to the cessation of such signalling energy on one of the channels to assume a looped fault mode in which signals received in the other channel are re-routed on to the said one channel, and the first station including means for recognising the interruption of signals, the routing means therein being responsive to such interruption to assume a through fault mode in which signals received on each channel are forwarded in the same channel, whereby a single folded transmission path is re-formed following the said re-routing occurring at two of the further stations.

4,573,045

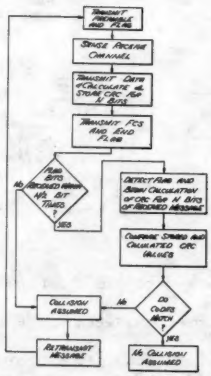
COLLISION DETECTION METHOD USING CRC CODE

Robert Galin, Saratoga, Calif., assignor to Intel Corporation, Santa Clara, Calif.

Filed Jan. 24, 1983, Ser. No. 460,159

Int. Cl.⁴ H04Q *9/00*

U.S. Cl. 340—825.5 **15 Claims**


SINGLE RECEIVE CHANNEL
DETECT FLAG AND BEGIN CALCULATION OF CRC FOR N BITS OF RECEIVED MESSAGE
COMPARE STORED AND CALCULATED CRC VALUES
COLLISION ASSUMED
NO
YES
RETRANSMIT MESSAGE

1. In a data communication system having first and second stations coupled to a common line, an improved method utilized by said first station for determining if a message transmitted by said first station has collided with a message transmitted by said second station, comprising the steps of:

calculating the value of a predetermined code for N bits of said transmitted message; said predetermined code containing the same number of bits for all values of N;

storing the value of said code after N bits;

receiving said message on said line and computing said predetermined code for N bits of said received message;

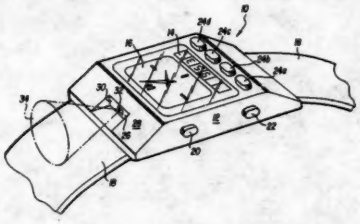
comparing the value of said stored code value with the value of said computed code value for said received message;

whereby a collision is detected if said stored and computed code values do not match.

4,573,046
WATCH APPARATUS AND METHOD FOR A UNIVERSAL ELECTRONIC LOCKING SYSTEM

Douglas A. Pinnow, Laguna Hills, Calif., assignor to Universal Photonics, Inc., Cheshire, Conn.

Filed Nov. 1, 1983, Ser. No. 547,713
Int. Cl.[4] E05B *47/00*; G08B *13/08*; H04Q *9/00*
U.S. Cl. 340—825.56 36 Claims

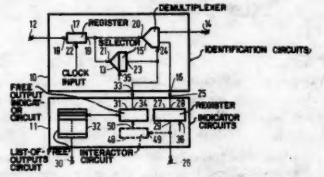


1. An electronically actuated locking system comprising a signal transmitting unit contained within a watch and energized by the power source of said watch so as to transmit an encoded optical signal to a signal receiving unit; said signal transmitting unit comprising light emitting means, a first controller which actuates said light emitting means so as to trasmit said encoded signal through an optical port of said watch to said signal receiving unit, said first controller including a first programmable memory unit for storing data corresponding to a plurality of different encoded signals, and means for entering said data into said first memory unit, and said signal receiving unit comprising a photodetector for receiving said encoded signal, a processor which compares said received encoded signal to one or more of a plurality of different codes contained in a second programmable memory unit and means for deactivating a lock mechanism when said received encoded signal matches one of said codes contained in said second memory unit.

4,573,047
BINARY SELECTOR STAGE AND A SELECTOR AND SELECTOR SYSTEM COMPRISING SUCH SELECTOR STAGES

Cornelis J. Koomen, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 28, 1983, Ser. No. 461,804
Claims priority, application Netherlands, Feb. 16, 1982, 8200580
Int. Cl.[4] H04Q *9/00*, *11/04*
U.S. Cl. 340—825.67 16 Claims



1. A selector stage comprising an identification circuit and an indicator circuit,

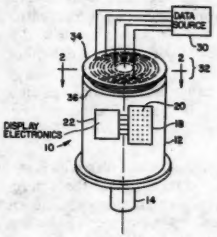
said identification circuit including an input to which signals having respective destination addresses are applied, and storage means storing a plurality of destination addresses and means for identifying individually each of a plurality of applied predetermined destination addresses by comparison with said plurality of addresses pre-stored within said identification circuit and means for transferring identified destination addresses which have been applied to said indentification circuit to a first output and means for transferring indication signals to an indicator output of said identification circuit for indicating in response to said comparison whether a destination address has been identified or not identified;

said indicator circuit including a first input connected to said first output of said identification circuit for applying the individually identified destination addresses to the indicator circuit, and further including means for transferring said individually identified destination address to a first indicator circuit output, and a second input connected to the indicator output of the identification circuit, and means responsive to the signal at said second input for indicating an address of a free output for the identified destination address, and means for transferring said free output address to a second indicator circuit output.

4,573,048
HIGH SPEED LINK FOR ROTATING DISPLAY

Glen R. Dash, Watertown, Mass., assignor to Dash Strauss Associates, Watertown, Mass.

Continuation of Ser. No. 674,481, Nov. 23, 1984, abandoned, which is a continuation of Ser. No. 335,739, Dec. 30, 1981, abandoned. This application May 8, 1985, Ser. No. 731,769
Int. Cl.[4] G08C *19/10*
U.S. Cl. 340—870.37 5 Claims



1. A wireless high-speed data link for interconnecting a stationary data device and a rotating data device, the data link comprising:

A. a first group of interdigitated conductive elements on the stationary device; and

B. a second group of interdigitated conductive elements on the rotating device; wherein:

C. the first and second groups together include a first set of conductive elements, each conductive element of the first set from the first group being positioned closely adjacent a corresponding conductive element of the first set from the second group to form a capacitor that establishes a signal path interconnecting the data devices and that has a capacitance that is substantially constant with rotation of the rotating device, the first set of conducting devices establishing a plurality of signal paths;

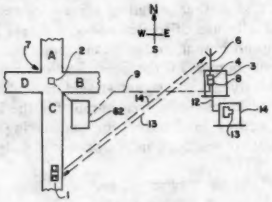
D. the first and second groups together include a second set of conductive elements, each conductive element of the second set from the first group being positioned closely adjacent a corresponding conductive element of the second set from the second group to form a capacitor that establishes a ground-return path interconnecting the data devices and that has a capacitance that is substantially constant with rotation of the rotating device; and

E. a conductive element of the second set is disposed intermediate each pair of successive conductive elements of the first set.

4,573,049
TRAFFIC SIGNAL LIGHT CONTROL FOR EMERGENCY VEHICLES

Carl J. Obeck, Pompano Beach, Fla., assignor to Bourse Trading Company, Ltd., Philadelphia, Pa.

Filed Apr. 21, 1983, Ser. No. 487,247
Int. Cl.[4] G08G 1/07
U.S. Cl. 340—924 **6 Claims**



1. Traffic signal light control system for emergency vehicles, comprising:

a plurality of traffic signal lights for directing traffic through a plurality of street intersections;

at least one emergency vehicle, having a vehicle identity code;

emergency vehicle traffic control apparatus disposed in said emergency vehicle;

a plurality of traffic signal light control apparatus equal to said plurality of traffic lights, each disposed in the vicinity of a respective traffic signal light for controlling it;

central control apparatus disposed in a spaced-away location from said plurality of said traffic signal light control apparatus;

a plurality of wire communication links equal to said plurality of traffic signal light control apparatus, connecting said central control with a respective traffic signal light control apparatus;

two-way radio communications link which includes a vehicle radio receiver-transmitter in the emergency vehicle connected with the emergency vehicle traffic control apparatus and a fixed radio receiver-transmitter, all receiver-transmitters using the same frequency, and the fixed receiver-transmitter operatively connected with the central control apparatus;

emergency vehicle control console disposed in said emergency vehiclé operatively engaging said emergency vehicle traffic control apparatus, for receiving a command which includes the vehicle's identity;

said signal control apparatus comprising a central processing unit having electronic memory, at least one selected signal pattern and a control program stored in said electronic memory and being responsive to said command which is received from said emergency vehicle via said two-way radio communications link, said central control and said wire communications link for activating said selected signal pattern for guiding the emergency vehicle through the intersection.

4,573,050
DUAL SCAN RATE RADAR

William M. Waters, Millersville, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

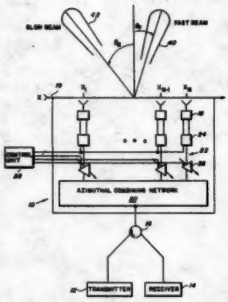
Filed Feb. 17, 1983, Ser. No. 467,421
Int. Cl.[4] G05L 7/28
U.S. Cl. 343—17.1 R **18 Claims**

1. A dual scan rate search radar system (DSR) comprising:

a phased array antenna including a like plurality of radiators and variable phase shifters wherein each of said phase shifters is connected to a different radiator;

transmitter means, having its output connected to said antenna, for transmitting a transmission beam of rf pulses;

receiving means, having its input connected to said antenna, for receiving and processing a receiving beam of echos from the transmission beam pulses;

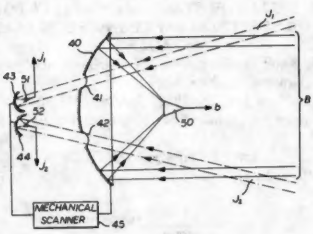


control means, interconnected with said transmitter and said phase shifters for scanning said transmission and receiving beams at predetermined different dual rates, R_S and R_F, by adjusting said phase shifters, wherein the beam scanned at R_S is designated the slow beam and the beam scanned at R_F is designated the fast beam.

4,573,051
ADAPTIVE SYSTEM FOR SUPPRESSING INTERFERENCES FROM DIRECTIONAL JAMMERS IN ELECTRONICALLY OR MECHANICALLY SCANNING RADAR

Alfonso Farina, Rome, Italy, assignor to Selenia S.p.A., Rome, Italy

Filed Aug. 2, 1982, Ser. No. 404,234
Int. Cl.[4] G01S 7/36
U.S. Cl. 343—18 E **3 Claims**



1. In a radar having a main antenna with a collector of microwave energy incident along a main lobe of a radiation pattern thereof, the incident energy received within an effective area of said collector being encumbered by interfering radiation from a directional jammer propagating along a side lobe of said pattern, and a processor with a principal receiving channel for translating the incident microwave energy from said collector into a raw output signal contaminated by the interfering radiation,

the combination therewith of ancillary antenna means disposed within the effective area of said collector and oriented in the direction of said side lobe for picking up said interfering radiation and translating same into a collateral signal, said processor further including at least one auxiliary receiving channel connected to said ancillary antenna means for generating a contamination signal derived from said collateral signal and cancellation means connected to

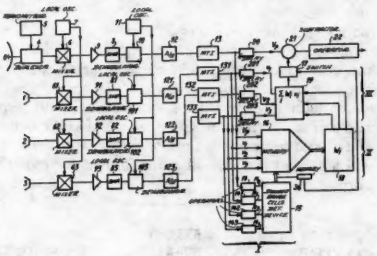
said auxiliary channel where said cancellation means comprises a subtractor with a first input receiving said raw output signal from said principal channel and a second input receiving said contamination signal from said auxiliary channel and band-pass filter coupled to output of said subtractor, said cancellation means further comprising an adaptive loop including mixer means with an output connection extending to said second input of said subtractor and with a feedback connection coupled to an output of said band-pass filter, said collector comprising a reflector centered on an axis and a first horn at focal point of said reflector, said ancillary antenna comprising first and second microwave receivers positioned for irradiation through apertures of said reflector, said first and second microwave receivers each comprise second and third horns respectively, distances of phase centers of said second and third horns to said reflector equal distance of said first horn to said reflector, said reflector and said first and second microwave receivers are coupled with mechanical scanning means for joint displacement.

4,573,052

METHOD AND DEVICE FOR REDUCING THE POWER OF JAMMING SIGNALS RECEIVED BY THE SIDELOBES OF A RADAR ANTENNA

Jean C. Guillerot; Hubert Joncour; Gérard Auvray, and Daniel Balduzzi, all of Paris, France, assignors to Thomson CSF, Paris, France

Filed Apr. 16, 1982, Ser. No. 369,119
Claims priority, application France, Apr. 30, 1981, 81 08667
Int. Cl.⁴ G01S 7/36
U.S. Cl. 343—18 E **10 Claims**



4. Apparatus for reducing the power of jamming signals received by the sidelobes of a radar main antenna with which are associated a plurality of auxiliary antennas, said main antenna being associated with a main channel which processes a main channel signal, each one of said plurality of auxiliary antennas being associated with one of a plurality of auxiliary channels each one of which processes an auxiliary channel signal, respectively, said radar including a plurality of range cells which may be jammed or unjammed, said radar emitting a signal which is returned in a recurrence of associated main channel and auxiliary channel signals, comprising:

filter means adapted for connection in each of said channels for performing a moving target indication operation on said main channel and auxiliary channel signals;

jammed range cells detection means, connected to said filter means, for detecting which ones of said range cells are jammed in said recurrence;

memory means, connected to said jammed range cells detection means, for recording positions of jammed range cells in said recurrence;

means, connected to said filter means and to said jammed range cells detection means, for selecting and storing certain ones of said jammed range cells;

means, connected to said selecting and storing means, for determining weighting coefficients for said certain ones of said jammed range cells;

weighted summation means, connected to said weighting coefficents determining means and to the filter means associated with said auxiliary channels, for forming a weighted linear combination signal, relating solely to said jammed range cells, from said weighting coefficients;

switch means, controlled by said memory means and connected to said weighted summation means, for supplying said weighted linear combination signal synchronous with an associated main channel signal; and

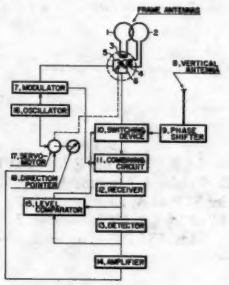
subtracter means, connected to said switch means and to said main channel filter means, for subtracting said weighted linear combination signal from said main channel signal to produce an output signal having reduced jamming power.

4,573,053

AUTOMATIC DIRECTION FINDER

Kenzo Mori, and Hyo Yasuda, both of Tokyo, Japan, assignors to Taiyo Musen Co., Ltd., Tokyo, Japan

Filed Dec. 6, 1982, Ser. No. 447,097
Claims priority, application Japan, Apr. 5, 1982, 57-55362
Int. Cl.⁴ G01S 5/04
U.S. Cl. 343—441 **4 Claims**



1. An automatic direction finder comprising,

a pair of loop antennas disposed so that their directivities are orthogonal to each other,

a goniometer including a pair of search coils perpendicular to each other, each search coil producing an output,

at least one low frequency oscillator for producing a low frequency signal or signals,

at least one modulator for receiving the low frequency signal or signals from the low frequency oscillator to modulate at least one of the outputs from the search coils,

a non-directional vertical antenna producing an output,

a phase shifter for phase shifting the output from the vertical antenna,

means for combining the modulated signal or signals with the phase shifted signal from the phase shifter,

means for amplifying and detecting the combined signal, and

a control circuit for isolating the vertical antenna after completion of the initial measurement of a direction,

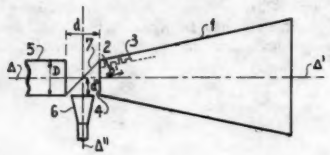
whereby in the initial measurement the loop antennas and the vertical antenna are used and in the final measurement only the loop antennas are used.

4,573,054

EXCITATION DEVICE FOR A DUAL BAND ULTRA-HIGH FREQUENCY CORRUGATED SOURCE OF REVOLUTION

Jean Bouko; Jean-Claude Durand; Jean Le Foll, and Francois Salvat, all of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Apr. 26, 1983, Ser. No. 488,711
Claims priority, application France, Apr. 27, 1982, 82 07254
Int. Cl.[4] H01Q *13/02, 15/02*
U.S. Cl. 343—786 16 Claims



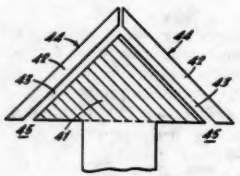
1. Excitation apparatus, comprising:
a main corrugated radiator;
means for providing low frequency excitation to said radiator;
means for providing high frequency excitation to said radiator; and
a spatial frequency filtering device disposed between said radiator and said low and said high frequency means, whereby said low and said high frequency means are physically decoupled from said radiator but are spaced from said radiator in such a way that hybrid balance is propagated in said radiator.

4,573,055

DIRECTIONALLY SENSITIVE RECEIVING ANTENNA

Thomas M. B. Wright, 5 Arnwood Mews, The Tene, Baldock, Hertfordshire SG7 6LA, England

Filed Dec. 9, 1981, Ser. No. 329,132
Int. Cl.[4] H01Q *1/36, 21/20*
U.S. Cl. 343—787 1 Claim



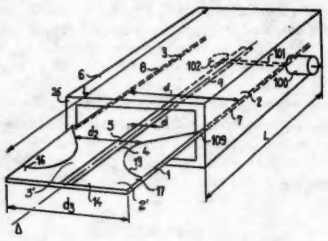
1. Apparatus comprising
a conical shell formed of a plurality of segments of gyrotropic material, each segment being separated from its two neighbors by an air gap or thin layer of dielectric material;
magnetic means disposed in said shell for producing a magnetic field through said gyrotropic material normal to the plane of said shell; and
signal transmission means coupled to each segment for transmitting radio-frequency voltages produced in a radial direction in said gyrotropic material by incident radio-frequency radiation.

4,573,056

DIPOLE RADIATOR EXCITED BY A SHIELDED SLOT LINE

Michel Dudôme, and Albert Dupressoir, both of Paris, France, assignors to Thomson CSF, Paris, France

Filed Dec. 10, 1982, Ser. No. 448,473
Claims priority, application France, Dec. 18, 1981, 81 23735
Int. Cl.[4] H01Q *1/38, 9/16*
U.S. Cl. 343—795 24 Claims



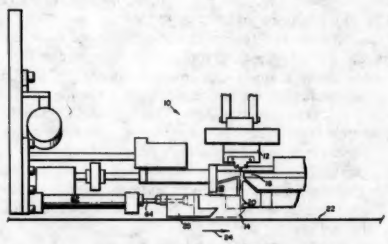
1. An electromagnetic wave radiator comprising:
a metal parallelepipedic case having an opening;
a dielectrical plate with a median longitudinal axis, said plate being metalized on one face thereof and positioned inside said case; and
a slot line formed by two parallel conducting first strips formed on said dielectric plate and in electrical contact with said case and symmetrical with respect to said axis, said case being dimensioned below cut-off with respect to said slot line to serve as a nonradiating waveguide shield; and
a radiating element including:
a prolongating member extending said dielectric plate through said opening, said member being metalized on one face thereof; and
two conducting second strips, symmetrical with respect to said axis and formed on said one face of said member, one end of said second strips prolongating said two first strips and a second end of said strips formed for radiating energy.

4,573,057

CONTINUOUS INK JET AUXILIARY DROPLET CATCHER AND METHOD

Richard Sutera, Centerville; Roger C. Burchett, Miamisburg, and Janet L. Dukes, Dayton, all of Ohio, assignors to Burlington Industries, Inc., Greensboro, N.C.

Filed Mar. 4, 1985, Ser. No. 708,056
Int. Cl.[4] G01D *15/18*
U.S. Cl. 346—1.1 26 Claims



1. A fluid jet printing apparatus for the printing of fluid droplets onto a print medium comprising:
means for generating plural streams of droplets along a

normal droplet flight path to be deposited upon said print medium;

electrostatic means for electrostatically deflecting selected ones of said droplets from said normal flight path into a deflected flight path, said droplets in said deflected flight path not being deposited onto said print medium;

sensing means for sensing an inability of said electrostatic means to deflect said selected ones of said droplets; and

auxiliary droplet catching means for intercepting substantially all of said droplets along said normal flight path in response to said sensed inability.

4,573,058

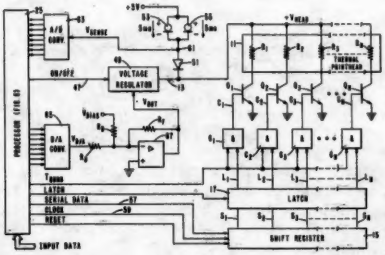
CLOSED LOOP THERMAL PRINTER FOR MAINTAINING CONSTANT PRINTING ENERGY

Ralf M. Brooks, Waterloo, Canada, assignor to NCR Canada Ltd - NCR Canada LTEE, Mississauga, Canada

Filed May 24, 1985, Ser. No. 737,836

Int. Cl.⁴ H05B *1/02*

U.S. Cl. 346—76 PH **12 Claims**



1. A thermal printing system comprising:

first means for producing serial character data and enabling pulses during a first mode of operation and for producing a control signal, serial test data and said enabling pulses during a second mode of operation;

thermal printing means for thermally printing characters, said thermal printing means including: a linear array of thermal elements; second means being responsive to said serial character data and said enabling pulses for selectively applying driving pulses corresponding to said character data to said thermal elements during the first mode of operation and being further responsive to said serial test data and said enabling pulses for selectively applying driving pulses corresponding to said serial test data to said thermal elements during the second mode of operation; and third means being responsive to the absence of said control signal for applying a head voltage to said thermal elements to enable said thermal elements to be selectively energized to thermally print characters in accordance with said serial character data and being further responsive to the presence of said control signal for enabling said thermal elements to be selectively measured during each second mode of operation;

fourth means coupled to said thermal elements being responsive to the absence of said head voltage for selectively developing associated measurement signals for said thermal elements during each second mode of operation, said measurement signals having amplitudes representative of the respective resistances of said thermal elements;

fifth means responsive to the measurement signals for developing an average value representative of the average resistance of said thermal elements during each second mode of operation;

sixth means for comparing an initial average value against each subsequent average value to develop a correction signal representative of the change in average value during each subsequent second mode of operation; and

seventh means coupled to said thermal printing means being responsive to said correction signal for causing said thermal printing means to maintain a consistent print quality of printed characters during any given first mode of operation.

4,573,059

INK DONOR SHEET COLOR DETECTING DEVICE

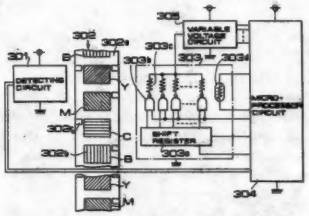
Mitsuru Shinma; Toyohiro Kobayashi; Masahito Mori; Shunji Tsuboi, and Masaru Sugita, all of Shizuoka, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 27, 1985, Ser. No. 706,395

Claims priority, application Japan, Feb. 29, 1984, 59-38204; Mar. 16, 1984, 59-51781; Mar. 23, 1984, 59-55832; Apr. 27, 1984, 59-85520

Int. Cl.⁴ G01D *15/10*

U.S. Cl. 346—76 PH **16 Claims**



1. An ink donor sheet color detecting device wherein an ink donor sheet, on which a plurality of inks of different colors are disposed, is contacted with record paper and ink is transferred to said record paper by means of a printing head to effect recording, comprising:

said ink donor sheet having a mark indicating portion on which marks having different shapes or lengths corresponding to said colors of said ink disposed on said ink donor sheet are provided at positions corresponding to areas of said color inks;

a mark detecting section located at a position corresponding to said mark indicating portion of said ink donor sheet for detecting a mark on said indicating portion;

a judging means for receiving a signal representative of results of detection of a mark from said mark detecting section to judge said color of said ink corresponding to said mark;

said printing head being constituted from a thermal head having dot heat generating elements for receiving an input pulse thereto to generate heat for transferring ink for said individual colors of said ink donor sheet, said color detecting device further comprising a temperature detector for detecting the temperature of said thermal head; and control means for receiving a signal from said temperature detector and another signal representative of a color from said judging means to control the size of an input pulse supplied to said dot heat generating elements depending upon the temperature of said thermal head and the color of the ink.

4,573,060

INSTRUMENT MARKER PEN AND PEN ARM ASSEMBLY

James R. Hubbard, Moorestown, and Ronald B. Berry, Stratford, both of N.J., assignors to Graphic Controls Corporation, Buffalo, N.Y.

Filed Sep. 29, 1983, Ser. No. 537,332

Int. Cl.⁴ G01D *15/16*

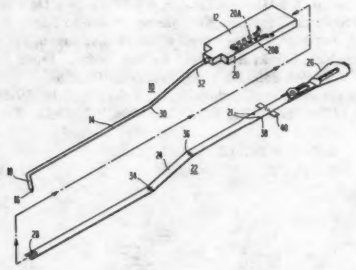
U.S. Cl. 346—140 A **6 Claims**

1. Line recording instrument marker pen comprising

(a) an ink reservoir body having a length and a width,

(b) an elongated stylus tube extending in the lengthwise direction from said body and terminating in a writing nib at the end thereof,

(c) a lengthwise slot on said body adapted to slidingly receive a mating elongated pen arm along the entire length



of said body and along substantially the entire length of said pen arm,

(d) a slidingly engageable retainer means adapted for retention of said body on said mating pen arm in the fully assembled position of said pen on said mating pen arm, wherein said stylus tube is coextensive with said pen arm.

4,573,061

IMAGE RECORDING APPARATUS

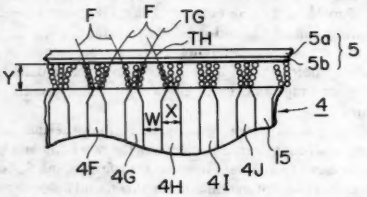
Haruo Fujii, Yokohama; Yuji Sakemi, Kawasaki, and Tsutomu Toyono, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed May 15, 1984, Ser. No. 610,486

Claims priority, application Japan, May 18, 1983, 58-87329; Apr. 28, 1984, 59-86892

Int. Cl.⁴ B41J *3/18*

U.S. Cl. 346—153.1 **5 Claims**



1. An image recording apparatus, comprising:

a recording electrode having an array of magnetic electrode elements which are electrically isolated;

a recording material;

means for causing relative movement between said recording electrode and said recording material while they are closely opposed to each other;

means for applying magnetic tone particles to a clearance between the recording electrode and the recording material;

means for generating a magnetic field across the clearance between the recording electrode and the recording material to form a chain of magnetic tone particles between the recording material and a leading edge of each of the magnetic electrode elements; and

means for applying and imagewise voltage signal between said recording electrode and said recording material,

wherein said electrode elements each have an end portion which is so converged toward said recording material that a clearance, measured along the array, between adjacent electrode elements is larger adjacent the end portions than the other portions.

4,573,062

THERMOSENSITIVE RECORDING SHEET

Toshimi Satake; Toshiaki Minami, both of Tokyo; Fumio Fujimura, Omoiya; Satoshi Oda, and Masato Magami, both of Nakatsu, all of Japan, assignors to Jujo Paper Co., Ltd., Tokyo and Yoshitomi-Pharmaceutical Ind., Ltd., Osaka, both of, Japan

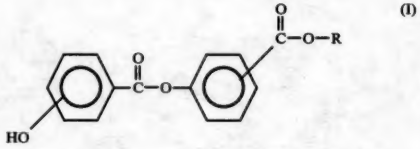
Filed Mar. 6, 1985, Ser. No. 708,947

Claims priority, application Japan, Mar. 7, 1984, 59-42130; May 8, 1984, 59-91363

Int. Cl.⁴ B41M *5/18*

U.S. Cl. 346—209 **7 Claims**

1. A thermosensitive recording sheet having a thermosensitive color developing layer containing a basic leuco dye and an organic color developer, said organic color developer consisting at least partly of a hydroxybenzoyloxybenzoic acid ester represented by the general formula (I)



(I)

wherein R represents an alkyl group, a cycloalkyl group, or an aryl, aralkyl or aryloxyalkyl group which may have at least one substituent selected from the class consisting of halogen atoms, nitro groups, hydroxyl groups, lower alkyl groups and lower alkoxy groups.

4,573,063

RECORD MEMBER

Robert E. Miller, and Steven L. Vervacke, both of Appleton, Wis., assignors to Appleton Papers Inc., Appleton, Wis.

Filed May 23, 1984, Ser. No. 612,956

Int. Cl.⁴ B41M *5/16, 5/22*

U.S. Cl. 346—216 **12 Claims**

1. A record member comprising a substrate and a developer composition comprising an addition product of phenol and a diolefinic alkylated or alkenylated cyclic hydrocarbon, said addition product being characterized by a hydroxyl unit greater than about 120–140.

4,573,064

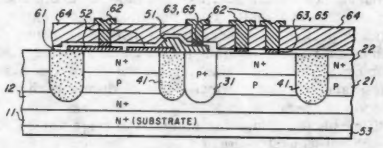
GaAs/GaAlAs HETEROJUNCTION BIPOLAR INTEGRATED CIRCUIT DEVICES

William V. McLevige, Plano; Han-Tzong Yuan, Dallas; Walter M. Duncan, Dallas, and Friedrich H. Doerbeck, Dallas, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Nov. 2, 1981, Ser. No. 317,367

Int. Cl.⁴ H01L *29/48, 29/161, 27/02, 23/48*

U.S. Cl. 357—16 **31 Claims**



1. An integrated circuit device comprising:

substrate means including at least a body of a first III-V

compound semiconductor material of one conductivity type and defining an emitter region;

a first layer of a second III-V compound semiconductor material of the other conductivity type disposed on said body defining said emitter region, said second III-V compound semiconductor material having a bandgap which is smaller than the bandgap of said first III-V compound semiconductor material, said first layer of said second III-V compound semiconductor material of the other conductivity type defining a base region;

a second layer of said second III-V compound semiconductor material being disposed on said first layer and being of said one conductivity type, said second layer of said second III-V compound semiconductor material of said one conductivity type defining a collector region; and

electrical contact means respectively coupled to each of said emitter, base and collector regions.

4,573,065

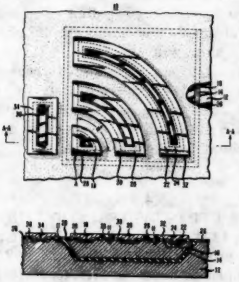
RADIAL HIGH VOLTAGE SWITCH STRUCTURE

Hans W. Becke, Morristown, N.J.; John C. Gammel, Robesonia, Pa.; Adrian R. Hartman, New Providence, N.J.; Muhammed A. Shibib, Wyomissing Hills, Pa., and Robert K. Smith, New Providence, N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Dec. 10, 1982, Ser. No. 448,631

Int. Cl.[4] H01L *29/74, 20/06, 29/80*

U.S. Cl. 357—38 **15 Claims**



1. A structure comprising:

a semiconductor body having a bulk portion and a major surface;

a localized first region of the body which is of a one conductivity type; and

a localized second region of the body which is of the opposite conductivity type;

the localized first and second regions being of relatively low resistivity as compared with the bulk of the semiconductor body and being separated from each other by portions of the bulk of the semiconductor body;

each of the first and second regions having a respective portion that forms part of the major surface and having a separate electrode connected thereto;

a localized third region, which is of the one conductivity type and of lower conductivity than that of the first region, surrounding the second region so as to separate it from the bulk portion of the semiconductor body;

the first, second, and third regions each having a side arc portion which is an arc of each of a plurality of concentric circles having mutually different radii, the radius of the circle corresponding to the second region being greater than the radius of the circle corresponding to the first region;

the length of the side arc portion of the second region being greater than the length of the side arc portion of the first region;

the ratio of the length of the side arc portion of the second region to that of the first region being such that in response to a forward applied bias a current flow between the first and second regions is facilitated in which the charge carrier injection efficiencies of the first and second regions are substantially equal.

4,573,066

BREAKDOWN VOLTAGE INCREASING DEVICE WITH MULTIPLE FLOATING ANNULAR GUARD RINGS OF DECREASING LATERAL WIDTH

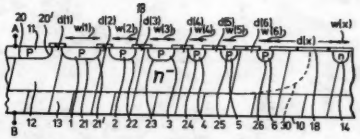
Kenneth R. Whight, Horsham, England, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 5, 1983, Ser. No. 558,409

Claims priority, application United Kingdom, Dec. 3, 1982, 8234609

Int. Cl.[4] H01L *29/06*

U.S. Cl. 357—52 **9 Claims**



1. A semiconductor device comprising a semiconductor body having a portion of one conductivity type adjoining a major surface of the body, an active device region of the opposite conductivity type also adjoining said major surface and forming with said portion a main p-n junction which terminates at said major surface and is operated under reverse bias in at least one mode of operation of the device, and at least three annular regions of said opposite conductivity type extending around said active device region, which annular regions also adjoin said major surface and form with said portion auxiliary p-n junctions located within the spread of a depletion layer from the reverse-biased main p-n junction so as to increase the breakdown voltage of the main p-n junction, the spacing between two outer annular regions which are remote from the active device region being larger than the spacing between the active device region and the inner annular region which is adjacent the active device region, said active device region and said annular regions being more highly doped than said portion of the body, characterised in that the inner annular region which is adjacent the active device region is wider than said two outer annular regions which are remote from the active device region.

4,573,067

METHOD AND MEANS FOR IMPROVED HEAT REMOVAL IN COMPACT SEMICONDUCTOR INTEGRATED CIRCUITS

David B. Tuckerman, and Roger F. W. Pease, both of Stanford, Calif., assignors to The Board of Trustees of the Leland Stanford Junior University, Stanford, Calif.

Continuation of Ser. No. 239,407, Mar. 2, 1981, Pat. No. 4,450,472. This application Mar. 7, 1984, Ser. No. 587,018

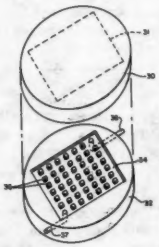
The portion of the term of this patent subsequent to May 22, 2001, has been disclaimed.

Int. Cl.[4] H01L *23/34, 23/46, 23/36*

U.S. Cl. 357—82 **18 Claims**

1. A heat generating device having improved heat removal capability comprising a body portion having an external surface for cooling, a plurality of microscopic channels defined by fins in intimate contact with said external surface, each of said

microscopic channels having a width selected to increase the heat transfer over that associated only with an increase in area thereby to substantially increase the heat transfer from the



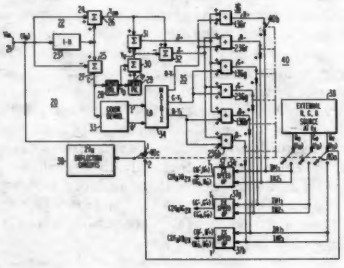
body per unit area of channel surface, and a cover attached to said fins to confine the flow of a coolant fluid through said channels.

4,573,068

VIDEO SIGNAL PROCESSOR FOR PROGRESSIVE SCANNING

Denis P. Dorsey, Levittown, Pa.; Walter E. Sepp, Plainsboro, and Dalton H. Pritchard, Princeton, both of N.J., assignors to RCA Corporation, Princeton, N.J.

Filed Mar. 21, 1984, Ser. No. 591,996
Int. Cl.[4] H04N *11/20, 11/04, 9/67, 9/64*
U.S. Cl. 358—11 **9 Claims**



1. Video signal processing circuitry, comprising:

means for generating a luminance signal at a first line rate;

means for generating a chrominance signal at said first line rate;

a color matrix responsive to said luminance and chrominance signals for generating therefrom a first set of first, second and third color signals at said first line rate, each containing both luminance and chrominance information; and

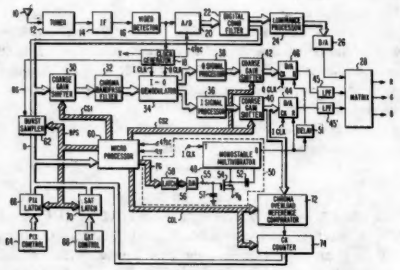
a time compression circuit coupled to the output of said color matrix for time compressing said first, second and third color signals that are generated at said first line rate to develop a time compressed second set of first, second and third color signals, each of the signals of said second set being developed at a faster, second rate that is a multiple of the first line rate.

4,573,069

CHROMINANCE FINE GAIN CONTROL IN A DIGITAL TELEVISION RECEIVER

Henry G. Lewis, Jr., Hamilton Square, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Mar. 29, 1984, Ser. No. 594,807
Int. Cl.[4] H04N *9/64, 5/52*
U.S. Cl. 358—27 **13 Claims**



1. A video signal processing apparatus for varying the magnitude of video signals comprising:

a source of digitized video signals;

a source of gain control signals;

a digital to analog converter coupled to said source of digitized video signals for providing pulse amplitude modulated output signal representing the digitized video signals from said source; and

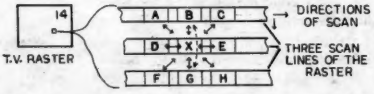
means responsive to said gain control signals and coupled to said digital to analog converter for varying the duration of the pulses constituting said pulse amplitude modulated signal to thereby vary the time averaged amplitude of said pulse amplitude modulated signals.

4,573,070

NOISE REDUCTION SYSTEM FOR VIDEO SIGNALS

J. Carl Cooper, 1373 Sydney Dr., Sunnyvale, Calif. 94087

Continuation of Ser. No. 268,870, Jun. 1, 1981, abandoned, which is a continuation-in-part of Ser. No. 30,288, Apr. 16, 1979, Pat. No. 4,305,091, which is a continuation-in-part of Ser. No. 763,904, Jan. 31, 1977, abandoned. This application May 31, 1984, Ser. No. 615,666
Int. Cl.[4] H04N *9/64*
U.S. Cl. 358—36 **43 Claims**



1. Apparatus for reducing noise on an input televison video signal which apparatus contains a comparison circuit means responsive to said input video signal to compare a central picture element of said video signal to at least one of the surrounding picture elements of said video signal to determine the difference thereof and to further compare said difference to a threshold, said threshold adjusted automatically in response to said input television video signal, and a processing circuit responsive to said picture elements and said comparison to sum portions of said surrounding element and said central element if said difference corresponding to said surrounding element is less than said threshold, with said portion of surrounding element being decreased otherwise, which decreased portion may be zero and which sum is the noise reduced value substituted

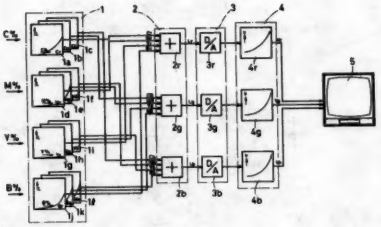
for said central element by said processing circuit before said signal is output from said apparatus.

4,573,071

METHOD AND SYSTEM FOR DISPLAYING A COLOR IMAGE SIMULATING A MULTI-COLOR PRINTED MATTER ON A SCREEN

Takashi Sakamoto, Kyoto, Japan, assignor to Dainippon Screen Mfg. Co., Ltd., Kyoto, Japan

Filed May 24, 1983, Ser. No. 497,492
Claims priority, application Japan, Jun. 8, 1982, 57-98980
Int. Cl.[4] H04N *1/40*
U.S. Cl. 358—76 10 Claims



1. A method for displaying a color image, simulating a multi-color print on a color picture displaying device by using density signals of separated colors obtained from an original color picture, comprising the steps of:

(a) retrieving from a memory device a value—log (1—Di/k) (where k is a constant of density-saturation point) corresponding to a density D_i of each of the separated color components relative to said density signals;

(b) selectively summing said values of step (a) to obtain a total density signal for each color component; and

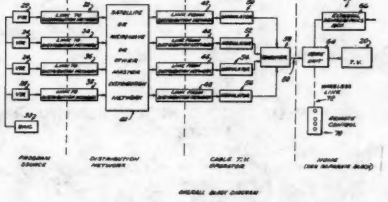
(c) controlling said color picture displaying device by using said total density signal for each decomposed color.

4,573,072

METHOD FOR EXPANDING INTERACTIVE CATV DISPLAYABLE CHOICES FOR A GIVEN CHANNEL CAPACITY

Michael J. Freeman, Sands Point, N.Y., assignor to ACTV Inc., Port Washington, N.Y.

Filed Mar. 21, 1984, Ser. No. 591,863
Int. Cl.[4] H04N *7/10*
U.S. Cl. 358—86 31 Claims



1. In a method for enabling a plurality of different continuous real time interactive television messages to be substantially simultaneously provided during a given prerecorded television program from a plurality of multichannel television receivers comprising a one-way common television signal distribution network, the improvement comprising the steps of:

(a) transmitting in sequence a plurality of different multichannel television message stacks, with each stack comprising a plurality of time concurrent multichannel television messages, said plurality of stacks comprising a stacking array, said stacking array providing a plurality of selectable time and space multiplexed complete prerecorded television messages, said array being transmitted over a plurality of contemporaneous channels to said plurality of multichannel television receivers through said one way distribution network, a single substantially complete television message being interactively selectable from said array for providing said real time interactive television message for said multichannel television receiver, the quantity of available interactively selectable prerecorded television messages in said array being greater than the quantity of said plurality of available contemporaneous television channels, said array comprising a television programming sequence having an interactively variable program information content for a given television program, said program content for said given television program further comprising a common prerecorded television message commonly displayable during said given television program irrespective of any interactive selection of said interactively selectable television messages;

(b) providing said array over said plurality of channels to said multichannel receiver through said one-way distribution network from a multichannel storage means; and

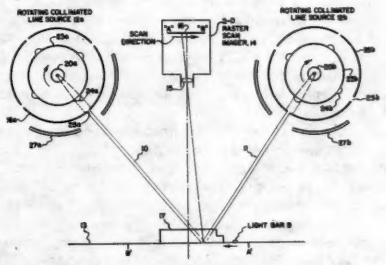
(c) interactively selecting in real time multichannel message path through said array for providing said television programming sequence program information content, said interactive selection being multiplexed in both time and space in said array and selecting said message path through said array in reponse to a single interactive selection, a different interactive selection providing a different message path through said array and a different program information content for said television programming sequence, a different receiver being capable of independently selecting a different program information content from said array for said television programming sequence, whereby multiple users of said one way distribution network may obtain an individualized program information content for said television programming sequence, with the quantity of available interactively selectable program information contents in said array for said television programming sequence being greater than the quantity of available channels of contemporaneous message transmission.

4,573,073

INTEGRATED LIGHTING AND CAMERA SYSTEM

Nelson R. Corby, Jr., Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Jun. 2, 1983, Ser. No. 500,508
Int. Cl.[4] H04N *7/00*
U.S. Cl. 358—96 11 Claims



7. A method of rapidly producing a two-valued height-based image of an object comprising:

focusing a two-dimensional, raster scan electronic imager onto a plane that intersects said object;

projecting a continuous light pattern onto said plane, the image of said light pattern being discontinuous when light is incident on said object and image segments are displaced by an amount depending on object height; and

moving said light pattern along said plane to progressively illuminate a designated area in a time period equal to one frame scan time of said imager and in step with electronically scanning said imager and reading out image data.

4,573,074

CODING AND DECODING METHOD AND SYSTEM FOR VARIABLE-LENGTH SEQUENCES OF DIGITAL DATA

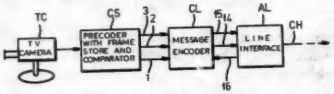
Gian B. Alaria; Paolo Destefanis, and Cesare Poggio, all of Turin, Italy, assignors to CSELT Centro Studi e Laboratori Telecomunicazioni S.p.A., Turin, Italy

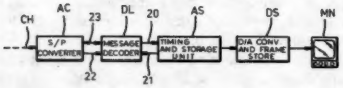
Filed Dec. 9, 1983, Ser. No. 559,917

Claims priority, application Italy, Dec. 9, 1982, 68439 A/82

Int. Cl.[4] H04N *7/12*

U.S. Cl. 358—136 **4 Claims**





1. A method of conveying a sequence or original message signals from a transmitting station over a communication channel to a receiving station in the form of digital data words of reduced information content corresponding to the data-handling capacity of said channel, comprising the steps of:

(a) encoding said original message signals, at said transmitting station, into a plurality of different types of bit groups with at least partial elimination of redundancies, a first of said types, referred to as magnitude-indicating mode, representing magnitudes of a number of said message signals when said number of said message signals is not equal to corresponding message signals of a previous sequence, a second of said types being a qualitative code representing an information-reducing mode, when a number of said message signals is equal to corresponding message signals of a previous sequence thus eliminating a number of signal cycles due to redundancies in said sequence, a third of said types being a quantitative code representing a count of the number of signal cycles eliminated, a fourth of said types representing synchronization signals, a fifth of said types representing a changeover mode whereby said changeover mode indicates either a changeover from said magnitude-indication mode to said information reduction mode or a changeover from said information reduction mode to said magnitude indication mode;

(b) accumulating the bits of a predetermined number of said groups at said transmitting station;

(c) sending the accumulated bits at regular intervals over said channel to said receiving station;

(d) temporarily storing at said receiving station the bits arriving over said channel;

(e) reorienting the stored bits in groups corresponding to those of step (a) with decoding of said groups and separation of different types thereof from one another; and

(f) reconstituting the sequence of original message signals, with re-expansion of the information contained in the groups of said first, second and third types, under the control of locally generated timing signals correlated with the synchronization signals represented by the groups of said fourth type.

4,573,075

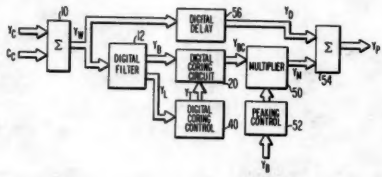
DIGITAL SIGNAL CORING APPARATUS WITH CONTROLLABLE CORING THRESHOLD LEVEL

Thomas V. Bolger, Merchantville, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Jun. 24, 1983, Ser. No. 507,555

Int. Cl.[4] H04N *5/21, 5/14*

U.S. Cl. 358—167 **20 Claims**



1. Digital signal processing apparatus comprising:

a first source for providing digital input signals to be processed;

digital filtering means coupled to said first source for developing first and second digital signals respectively including relatively higher and relatively lower frequency components of said digital input signals;

digital control means coupled to said digital filtering means for developing digital threshold signals controllable in response to said second digital signals; and

digital processing means, for producing output signals at an output terminal thereof, including:

comparing means coupled to said digital filtering means and to said digital control means for comparing said first digital signals and said digital threshold signals; and

means responsive to said comparing means for selectively coupling said first digital signals from said digital filter means to said output terminal when said first digital signal exceeds said digital threshold signals developed by said digital control means.

4,573,076

IMAGE SENSOR INCLUDING A REPEATING READ FUNCTION

Gil Tisue, Los Altos, Calif., and Ryuji Kondo, Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jul. 13, 1984, Ser. No. 630,601

Int. Cl.[4] H04N *3/12*

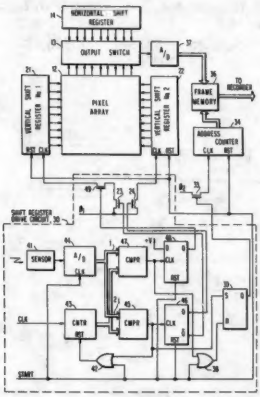
U.S. Cl. 358—212 **3 Claims**

1. A method of reading out a pixel array having N vertical lines, comprising the steps of:

(a) sequentially applying activating pulses to a first set of said vertical lines;

(b) sequentially applying activating pulses to a second set of said vertical lines, wherein said second set of vertical lines at least partially overlaps said first set of vertical lines;

(c) repetitively repeating steps (a) and (b), with subsequent first and second sets of vertical lines respectively containing higher ordered vertical lines until the Nth vertical line has received two activating pulses.

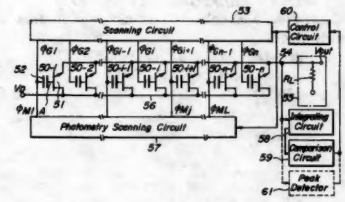


4,573,077

SOLID STATE IMAGE SENSING DEVICE WITH PHOTOMETRY FUNCTION

Masaharu Imai, Ina, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Sep. 4, 1984, Ser. No. 647,170
Claims priority, application Japan, Sep. 9, 1983, 58-165236
Int. Cl.[4] H04N *3/11*
U.S. Cl. 358—212 **7 Claims**



1. A solid state image sensing device comprising:

a plurality of pixels each including a static induction transistor having a gate, a drain and a source, and a capacitance coupled with the gate of said static induction transistor;

first readout means for reading image signals out of said pixels successively and resetting photocharge stored in the pixels due to light input;

second readout means for reading photometry signals out of selected pixels in a non-destructive manner;

means for processing said photometry signals to produce a detection signal indicating that desired photocharge has been stored in the pixels; and

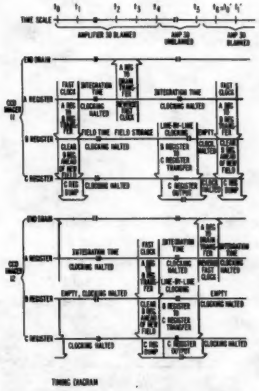
means for controlling said first and second readout means in accordance with said detection signal in such a manner that a photometry is effected while the light input is picked up.

4,573,078

METHOD FOR OPERATING A CCD IMAGER OF THE FIELD TRANSFER TYPE

Edward M. Rentsch, Plainsboro, and Larry A. Freedman, East Brunswick, both of N.J., assignors to RCA Corporation, Princeton, N.J.

Division of Ser. No. 439,995, Nov. 8, 1982. This application Apr. 1, 1985, Ser. No. 718,366
Int. Cl.[4] H04N *3/14*; H01L *31/00*
U.S. Cl. 358—213 **2 Claims**



1. A method for operating a CCD imager of the field transfer type having A, B and C registers, said method comprising the steps of:

projecting a radiant energy image into the A register of said CCD imager at least during recurrent image integration intervals, which are interleaved in time by field transfer intervals;

halting the clocking of said A register during said image integration intervals;

clocking said A and B register at relatively fast rate during selected ones of said field transfer intervals in such phasing as to transfer charge packets from said A register to said B register;

halting the clocking of said B and C registers for longer than a substantial portion of the image integration intervals following said selected ones of the field transfer intervals; and

at other times in the cycles of operation, clocking said B register line-by-line at a relatively slow rate during respective line retrace portions of image integration intervals and clocking said C register pixel-by-pixel during line trace portions of image integration intervals.

4,573,079

SENSOR ARRAY DRIVING CIRCUIT

Shingo Yamaguchi, Atsugi, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Jan. 28, 1983, Ser. No. 461,739
Claims priority, application Japan, Jan. 29, 1982, 57-13127
Int. Cl.[4] H04N *3/14*
U.S. Cl. 358—213 **10 Claims**

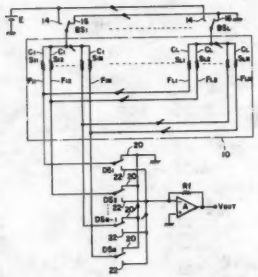
1. A sensor array driving circuit for driving a plurality of sensing elements divided into blocks, said sensing elements having first ends commonly connected to corresponding block electrodes and second ends each connected to individual electrodes, the corresponding ones of said individual electrodes in different blocks being commonly connected, said driving circuit comprising:

first selecting means connected to said block electrodes for

selecting one of said block electrodes to be operative in sequence;

second selecting means connected to said commonly connected individual electrodes for selecting one of said commonly connected individual electrodes to be operative in sequence while the corresponding one of said block electrodes is selected for operation; and

output means connected between said second selecting means and an output terminal of said driving circuit for supplying a signal from said sensor array to said output terminal serially.



4,573,080

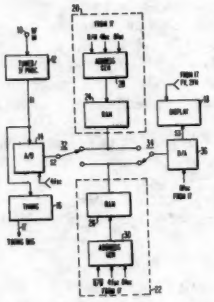
PROGRESSIVE SCAN TELEVISION RECEIVER WITH ADAPTIVE MEMORY ADDRESSING

Kenneth W. Maze, Indianapolis, Ind., assignor to RCA Corporation, Princeton, N.J.

Filed Jun. 28, 1984, Ser. No. 625,780

Int. Cl.⁴ H04N *5/68, 5/91*

U.S. Cl. 358—140 **5 Claims**



1. In a progressive scan video processor of the type having memory means for storing a video input signal supplied thereto during a first line interval thereof and for recovering the stored signal N-times during a subsequent line interval to provide a processed video output signal having a line rate N-times that of said video input signal, said memory means being coupled to address generator means for receiving read and write addresses therefrom, the improvement, comprising:

circuit means coupled to said generator means for storing the last address written in said memory means during a memory write operation and for controlling the starting time of at least one subsequent memory read operation in accordance with the stored address.

4,573,081

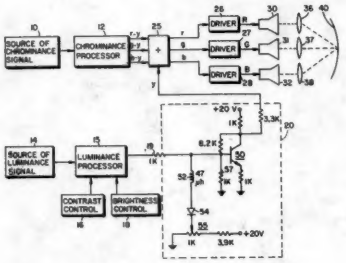
FREQUENCY SELECTIVE VIDEO SIGNAL COMPRESSION

Jereld R. Reeder, Indianapolis, Ind., assignor to RCA Corporation, Princeton, N.J.

Filed Aug. 26, 1983, Ser. No. 526,624

Int. Cl.⁴ H04N *5/74, 5/14*

U.S. Cl. 358—231 **10 Claims**



1. In a video signal processing and display system, apparatus comprising:

a source of image representative video signals comprising low and high frequency components and exhibiting a range of amplitude levels between black and white image levels;

image display means for reproducing an image in response to video signals provided thereto; and

signal translating means coupled to said source for providing translated video signals to said display means; wherein

said translating means comprises compressing means responsive to said video signal for selectively varying the amplification of low frequency white image representative amplitude components of said vide signal as a function of the magnitude of said low frequency video signal components, relative to high frequency white image representative amplitude components of said video signal.

4,573,082

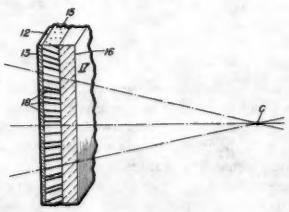
FOCUSABLE DISPLAY SCREEN

Richard V. Jeskey, Fiskdale, Mass., assignor to Incom, Inc., Southbridge, Mass.

Filed Jan. 16, 1984, Ser. No. 570,774

Int. Cl.⁴ H04N *5/72*

U.S. Cl. 358—250 **22 Claims**



1. An optical display screen, comprising:

(a) an optically-transparent matrix of material of uniform index of refraction and coefficient of thermal expansion and of substantially uniform thickness, having inner and outer surfaces,

(b) a layer of material on the inner surface adapted to be controllably induced to emit light, and

(c) a plurality of straight, elongated light-absorbing fibers having distinct axes, the fibers being integrally embedded

in said transparent layer and so directed that the lines containing the axes of the absorbing fibers converge a positive, finite distance in front of the screen, the matrix and fibers together constituting a transparent layer.

4,573,083
IMAGE TRANSMISSION SYSTEM

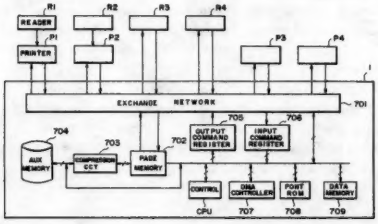
Katsuichi Shimizu, Kunitachi, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 18, 1983, Ser. No. 458,950

Claims priority, application Japan, Jan. 25, 1982, 57-9851; Jan. 25, 1982, 57-9852; Jan. 25, 1982, 57-9853; Jan. 25, 1982, 57-9854; Jan. 25, 1982, 57-9855; Jan. 25, 1982, 57-9856; Jan. 25, 1982, 57-9857; Jan. 25, 1982, 57-9858; Jan. 25, 1982, 57-9859; Jan. 25, 1982, 57-9860

Int. Cl.⁴ H04N *1/32*

U.S. Cl. 358—257 **23 Claims**



1. An image transmission system comprising:

one or more image output means;

one or more image recording means;

relaying means for transmitting image information entered from said output means to selected one or ones of said recording means; and

memory means for storing image information;

wherein said selected recording means, if not available for receiving said image information, advises the period of said unavailability, and said relaying means is adapted to store the image information to be transmitted in said memory means and to send said image information to said recording means after the lapse of said period of unavailability.

4,573,084
DOCUMENT INFORMATION FILING SYSTEM

Kazuhiko Iida, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Continuation of Ser. No. 255,633, Apr. 20, 1981. This application Dec. 20, 1983, Ser. No. 563,268

Claims priority, application Japan, Apr. 21, 1980, 55-52563

Int. Cl.⁴ H04N *1/30*

U.S. Cl. 358—300 **8 Claims**

1. A document information filing system comprising:

a keyboard for user designating index information identifying document information to be stored in said filing system or information previously stored therein to be retrieved, said index information including address data and an index code representing a characteristic of said document information;

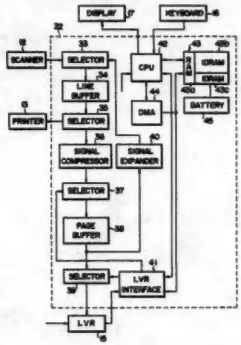
a recorder including

means adapted to receive an information recording medium having at least one first recording track for storing a plurality of such index informations related to separate document informations and a plurality of second recording tracks for storing document image information corresponding to each index information, and

means for reading the index information from said first recording track;

index memory means for storing all of the index information read from said first recording track; and

control means, connected to said keyboard, said recorder and said index memory means, for receiving user designated index information from said keyboard, for locating the index information specified by said keyboard among all the index information previously read from said first recording track and stored in said index memory means



and for driving said reproducing means to reproduce the image information stored in at least a portion of one of the second tracks of said information recording medium corresponding to the address data retrieved from said index memory means.

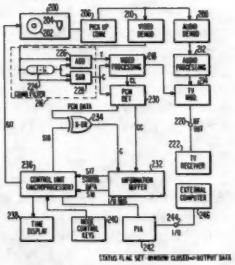
4,573,085
VIDEO DISC SYSTEM HAVING TRUE AND COMPLEMENTED DIGITAL AUXILIARY INFORMATION CODES

Nils O. Ny, Levittown, Pa., assignor to RCA Corporation, Princeton, N.J.

Filed Apr. 28, 1983, Ser. No. 489,304

Int. Cl.⁴ H04N *5/91*

U.S. Cl. 358—342 **3 Claims**



1. A video disc player, comprising:

signal recovery means for playing a video disc record and providing a video output signal in raster line scan form, selected horizontal lines of each field thereof having an error check encoded data component;

comb filter means for subtractively combining sequentially occurring lines of said video output signal to separate said data component from said video signal to provide a first line of separated data from each pair of sequentially occurring lines encoded in a first format and a second line of separated data for each triad of sequentially occurring lines encoded in a second format;

logic means having a first operating state for providing

non-inverting signal coupling and having a second operating state for provding inverting signal coupling;

error check decoder means coupled to said comb filter means via said logic means for receiving said lines of said data and having a first output for providing an error check decoded data output signal and a second output for providing a data status signal indicative of an error check result; and

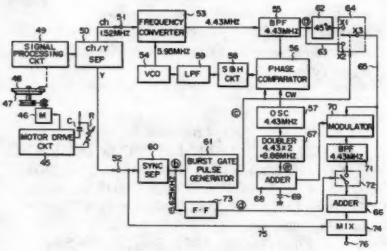
control means for placing said logic means in said first operating state for enabling error check decoding of each said pair of sequentially occurring lines encoded in said first format and for placing said logic means in said second operating state for enabling the error check decoding of each said triad of sequentially occurring lines encoded in said second format.

4,573,086

COLOR TELEVISION SIGNAL CONVERTING CIRCUIT

Tetsuro Sakai, and Kazuhiko Honda, both of Fukaya, Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Mar. 17, 1983, Ser. No. 476,402
Claims priority, application Japan, Mar. 19, 1982, 57-42695
Int. Cl.[4] H04N *9/42*
U.S. Cl. 358—11 **10 Claims**



6. A color television signal converting circuit comprising:

first signal generating means for generating a color television signal including at least a luminance signal and a first carrier chrominance signal of which frequency has been converted into a lower one than the standard carrier frequency and on which two color signal components (B-Y) and (R-Y) are quadrature-modulated;

chrominance/luminance signals separator means connected to receive color television signal and separating the same into the luminance signal and the first carrier chrominance signal;

luminance signal processing means for separating a line synchronization signal from said luminance signal and producing from the line synchronization signal a burst gate pulse signal and a switching control signal of which frequency is identical to a half frequency of said line synchronization signal;

frequency converting means for converting said first carrier chrominance signal into a second carrier chrominance signal having the standard carrier frequency by mixing a predetermined local frequency signal derived from controllable local oscillator means;

burst signal processing means including 45 degrees phase shift means and first switching means having a first signal terminal connected via said phase shift means to said frequency converting means, and a second signal terminal connected between said frequency converting means and the input of said phase shift means, said burst signal processing means being controlled by said burst gate signal in such a manner that during the color burst period, only the color burst signal contained in said second carrier chrominance signal is phase-shifted by 45 degrees by said phase shift means so as to deliver a third carrier chrominance signal of which color burst signal is delayed with respect to the (B-Y) axis;

a second signal generator means for producing as a modulating signal a second carrier signal of which frequency is twice as high as said standard carrier frequency;

modulator means for modulating said third carrier chrominance signal by said modulating signal;

first adding means in which said modulated third carrier chrominance signal is added to said third carrier chrominance signal from said burst signal processing means under a first predetermined adding ratio;

band pass filtering means connected to said first adding means and filtering only the (R-Y) signal component from said modulated and added third carrier chrominance signal;

second switching means connected to said band pass filtering means and controlled by said switching control signal derived from said luminance signal processing means in such a manner that it closes and opens alternately at every one line to deliver said (R-Y) signal component when closed; and

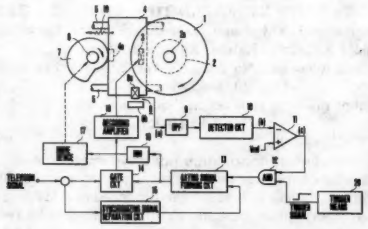
second adding means in which said (R-Y) signal component of the modulated and added third carrier chrominance signal is added to said third carrier chrominance signal derived from said burst signal processing means under a second predetermined adding ratio.

4,573,087

RECORDING APPARATUS

Nobuo Tezuka, and Tokihiko Ogura, both of Kanagawa, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 6, 1984, Ser. No. 678,647
Claims priority, application Japan, Dec. 9, 1983, 58-232539
Int. Cl.[4] H04N *5/78*; G11B *5/04, 5/09*
U.S. Cl. 360—60 **17 Claims**



1. A recording apparatus comprising:

(A) signal recording means including a movable recording head which is movable relative to a record bearing medium;

(B) moving means for intermittently moving said head relative to the medium;

(C) detecting means for detecting that said head has reached a predetermined substantially stable state at a position to which it has moved; and

(D) enabling means responsive to said detecting means for enabling said recording means to record a signal on the medium when said head has reached said predetermined substantially stable state.

4,573,088

CONTROL DEVICE FOR THE TAPE DECK OF A MAGNETIC TAPE CASSETTE APPARATUS

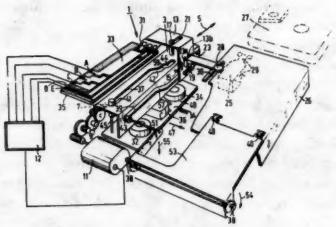
Klaus Kommoss, Wetzlar-Naunheim, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed May 31, 1983, Ser. No. 499,129

Claims priority, application Fed. Rep. of Germany, Jun. 2, 1982, 3220634; Apr. 30, 1983, 3315822

Int. Cl.[4] G11B *15/66*

U.S. Cl. 360—71 16 Claims



1. A control device for the tape deck of a magnetic tape cassette apparatus, for controlling tape deck functions including the loading and ejection of a cassette by means of a servo drive mechanism, said device comprising an actuating member and a servomotor for moving the actuating member, said actuating member mechanically setting the tape deck functions during movement to specific operating positions, characterized in that

said servomotor is a reversible servomotor, and said actuating member is an axially movable actuating rod which can be moved forwards and backwards in the direction of loading and ejection of the cassette,

the device includes a switching source and a control circuit, said switching source cooperating mechanically with said actuating rod to supply switching commands to said control circuit, which commands mark the actuating rod position, and

the control circuit sets the actuating rod to specific operating positions by means of electrically generated switching commands to said servomotor, in said specific operating positions the actuating rod mechanically setting the tape deck functions corresponding to said operating positions.

4,573,089

RECORDING AND REPRODUCING APPARATUS

Masaya Maeda; Noritsugu Hirata, and Hiroyuki Takimoto, all of Kanagawa, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 13, 1983, Ser. No. 503,635

Claims priority, application Japan, Jun. 14, 1982, 57-102590

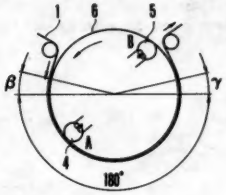
Int. Cl.[3] G11B *5/52, 5/56*

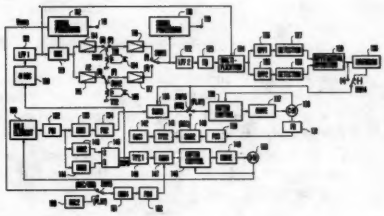
U.S. Cl. 360—77 19 Claims

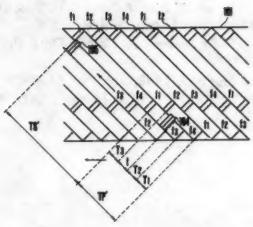
1. An information signal recording and reproducing apparatus, comprising:

(a) first means for forming, in turn, a number of tracks arranged in parallel on a recording medium and recording an information signal and a tracking control pilot signal on a first area of each track and recording said pilot signal on a second area of the same track;

(b) second means for concurrently reproducing said information signal and pilot signal from said first area; and







(c) third means for reproducing said pilot signal from the second area and at the same time recording the information signal on the first area.

4,573,090

VIDEO RECORDING/REPRODUCING APPARATUS WITH TAPE SLACK IN BACK-SPACE EDITING MODE

Eiichi Tsuchiya, Yokohama, Japan, assignor to Victor Company of Japan, Ltd., Japan

Filed Jul. 30, 1982, Ser. No. 404,395

Claims priority, application Japan, Aug. 13, 1981, 56-120469

Int. Cl.[4] G11B *15/20*

U.S. Cl. 360—85 5 Claims

1. A video signal recording and/or reproducing apparatus comprising:

a guide drum;

a supply reel disc and a take-up reel disc respectively fitted with a supply reel and a take-up reel of 9 tape cassette;

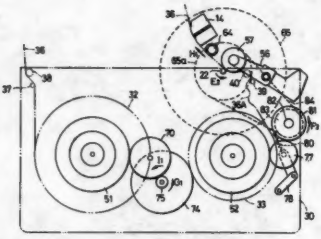
tape loading means for drawing out a tape from said tape cassette which is loaded into said apparatus and for loading the tape into a predetermined tape path so as to make contact with said guide drum throughout a predetermined range;

a capstan rotatable in a forward direction for causing said tape loaded by said tape loading means to move in the forward direction along the predetermined tape path;

tape feed back means responsive to an interruption of a recording operation for rotating said capstan in a reverse

direction and for rotating said supply reel disc in a tape retracting direction, to partially feed back said tape to said supply reel disc along the predetermined tape path for a period of time short enough to prevent interfering tape slack build-up; and

tape feed-out means for rotating said take-up reel disc in a



tape feed-back direction at a speed greater than a speed with which said tape is fed back by said tape feed back means during operation of said tape feed back means, so that the tape is fed back to said supply reel maintaining a slack of the tape in a tape path formed between said take-up reel and said capstan due to the tape fed out of said take-up reel.

4,573,091

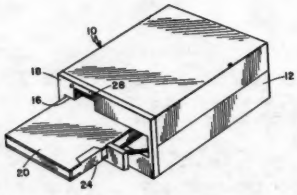
CARTRIDGE TAPE DRIVE

William M. Barton, Jr., Encinitas; John F. Murphy; Karl B. Offerman, both of San Diego, and Richard G. Fisher, Torrance, all of Calif., assignors to Cipher Data Products, Inc., San Diego, Calif.

Filed Nov. 15, 1982, Ser. No. 441,762

Int. Cl.[4] G11B *5/008, 15/00, 17/00*

U.S. Cl. 360—93 **17 Claims**



1. A drive for an elongate, rectangular tape cartridge having an access door along a side edge thereof, comprising:

an elongate housing having a slot opening at a transversely extending end of the housing, the slot being dimensioned to have the cartridge longitudinally inserted therein so that the side edge of the cartridge is substantially parallel to a longitudinally extending side of the housing

means for supporting the cartridge within the housing when the cartridge is inserted in the slot, including a tray and means for supporting the tray within the housing for longitudinal movement from a retracted position in which the tray is substantially contained within the housing to an extended position in which a portion of the tray extends through the slot;

means for opening the access door of the cartridge when the cartridge is inserted in the slot;

a magnetic head;

means for moving the magnetic head within the housing between operative engagement and disengagement with a length of tape in the cartridge exposed by opening the access door when the cartridge is inserted in the slot; and

means for moving the length of tape within the cartridge past the magnetic head.

4. A drive for an elongate, rectangular tape cartridge having an access door along a side edge thereof, comprising:

an elongate housing having a slot opening at a transversely extending end of the housing, the slot being dimensioned to have the cartridge longitudinally inserted therein so that the side edge of the cartridge is substantially parallel to a longitudinally extending side of the housing

means for supporting the cartridge within the housing when the cartridge is inserted in the slot;

means for opening the access door of the cartridge when the cartridge is inserted in the slot;

a magnetic head;

means for moving the magnetic head within the housing between operative engagement and disengagement with the length of tape in the cartridge exposed by opening the access door when the cartridge is inserted in the slot, including an elongate frame extending longitudinally within the housing, means for mounting the head to the frame adjacent a forward end of the frame, and means for pivotally mounting a rearward end of the frame to the housing; and

means for moving the length of tape within the cartridge past the magnetic head.

5. A drive for an elongate, rectangular tape cartridge having an access door along a side edge thereof, comprising:

an elongate housing having a slot opening at a transversely extending end of the housing, the slot being dimensioned to have the cartridge longitudinally inserted therein so that the side edge of the cartridge is substantially parallel to a longitudinally extending side of the housing

means for supporting the cartridge within the housing when the cartridge is inserted in the slot;

means for opening the access door of the cartridge when the cartridge is inserted in the slot;

a magnetic head;

means for moving the magnetic head within the housing, including a manually actuated lever rotatable on a front panel of the housing from an unlocked position in which the lever is clear of the slot and in which the head is disengaged from a length of tape in the cartridge to a locked position in which the lever blocks the slot and in which the head is engaged with the length of tape; and

means for moving the length of tape within the cartridge past the magnetic head.

6. A drive for an elongate, rectangular tape cartridge having an access door along a side edge thereof, the cartridge having a length of approximately six inches and a width of approximately four inches, and the door increasing the width of the cartridge to approximately five and three-quarter inches when fully open, comprising:

a rectangular housing having a front panel with a slot dimensioned to have the cartridge longitudinally inserted therein so that the side edge of the cartridge is substantially parallel to a longitudinally extending side of the housing, the housing having a width of approximately five and three-quarter inches with the front panel extending across the width of the housing, and the housing having a length of approximately eight inches;

means for supporting the cartridge within the housing when the cartridge is inserted in the slot;

means for opening the access door of the cartridge when the cartridge is inserted in the slot;

a magnetic head;

means for moving the magnetic head within the housing between operative engagement and disengagement with a length of tape in the cartridge exposed by opening the access door when the cartridge is inserted in the slot; and

means for moving the length of tape within the cartridge past the magnetic head.

4,573,092
ROTARY RECORDING MEDIUM REPRODUCING APPARATUS

Hiroyuki Sugiyama, Isehara; Masaki Sakurai; Ryozo Abe, both of Yokohama; Yasuhiro Yusa, Fujisawa; Kenji Yoshihara, Chiba, and Takashi Saito, Ayase, all of Japan, assignors to Victor Company of Japan, Ltd., Yokohama, Japan

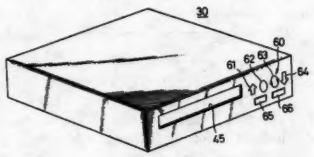
Filed Jun. 14, 1982, Ser. No. 388,142

Claims priority, application Japan, Jun. 15, 1981, 56-91918

The portion of the term of this patent subsequent to Nov. 1, 2000, has been disclaimed.

Int. Cl.[4] G11B *5/82, 19/10*

U.S. Cl. 360—97 **5 Claims**



1. A reproducing apparatus for playing a rotary recording medium, said reproducing apparatus comprising:

holding means for clamping and holding a lid plate and a rotary recording medium when a case having a jacket is inserted into the reproducing apparatus via an inserting opening, said jacket accommodating therein the rotary recording medium and having the lid plate for closing said jacket, said clamped and held lid plate and said rotary recording medium being recovered within an empty jacket are inserted through said inserting opening;

a control mechanism for putting said reproducing apparatus in an insertable or a non-insertable state, said case or said jacket being insertable into said reproducing apparatus through the inserting opening when said control mechanism causes said insertable state and being non-insertable when said control mechanism causes said non-insertable state;

detection means for detecting whether or not said rotary recording medium is within said reproducing apparatus;

a single load eject switch; and

a control circuit for controlling said control mechanism responsive to a detection output of said detection means and to an output of said load/eject switch, so that said case is insertable into the reproducing apparatus when said rotary recording medium is not within the reproducing apparatus and said empty jacket is insertable into the reproducing apparatus when said rotary recording medium is within the reproducing apparatus in order to enable a recovery of said rotary recording medium.

4,573,093
DISC CASSETTE LOADING APPARATUS

Yoshiaki Obama, Chigasaki, and Shojiro Asami, Atsugi, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Aug. 5, 1982, Ser. No. 405,575

Claims priority, application Japan, Aug. 10, 1981, 56-118664[U]

Int. Cl.[4] G11B *5/012*

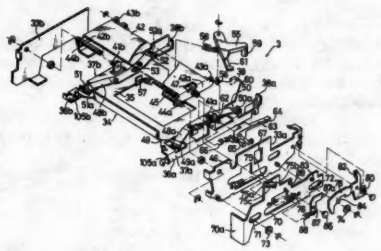
U.S. Cl. 360—97 **7 Claims**

1. A magnetic disc cassette loading apparatus for use with a disc drive and transducing means, comprising:

cassette holder means for accepting a magnetic disc cassette and which is positioned over the disc drive and transducing means and moves between a loading position and unloading position relative to said disc drive and transducing means;

a front panel cassette insertion aperture which substantially aligns with a cassette insertion aperture of the cassette holder means when the cassette holder means is in said loading position;

eject arm means provided on said cassette holder means which engages a leading end of the disc cassette during loading and which causes said cassette holder means to begin moving from the unloading position down to the loading position only after the disc cassette is fully inserted and a trailing edge of said disc cassette clears the



front panel insertion aperture, and for urging said disc cassette to be withdrawn from said cassette holder means during unloading; and

lock arm means provided in association with said eject arm means for preventing movement of said eject arm means until said cassette holder means is raised up and said front panel insertion aperture is in substantial alignment with said cassette holder means insertion aperture.

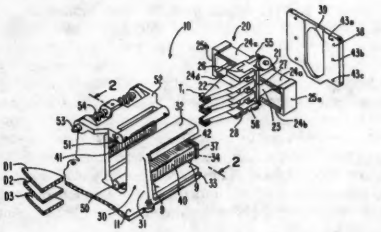
4,573,094
MOVING MAGNET DISC DRIVE ACTUATOR

Frank C. Gibeau, Los Altos, and Paul L. Farmer, San Martin, both of Calif., assignors to Atasi Corporation, San Jose, Calif.

Filed Aug. 10, 1983, Ser. No. 522,424

Int. Cl.[4] G11B *5/55;* **H02K** *41/02*

U.S. Cl. 360—106 **13 Claims**



1. A transducer actuator assembly for a rotating disc memory apparatus comprising:

a base plate;

a carriage;

means for mounting at least one transducer on the end of said carriage;

a rotating disc for storage of magnetic information;

means adjacent to an outer periphery of the rotating disc for guiding the carriage for movement with respect to said base plate along a desired linear travel path relative to the rotating disc;

at least one pair of fixed linearly extending coils each coil being of identical effective coil section fixed with respect to said base plate and symmetrically spaced about a plane that extends through the center of said carriage;

at least one pair of magnets fixedly connected to and extending laterally from opposite side walls of said carriage

extending parallel to said linear travel path and in juxtaposed spaced relation with a linear portion of said linearly extending coils forming at least two air gaps between said magnets and said coil sections on opposite sides of said carriage;

pole means forming a magnetic flux return path around said magnets and said coils; and

means for rigidly mounting said pole means to form air gaps between said pole means and said magnets.

4,573,095

MAGNETIC TAPE BACKING LEAF SPRING ASSEMBLY PARTICULARLY FOR COMPACT CASSETTES

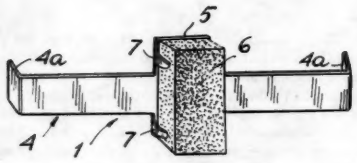
Abramo Bordignon, Senago, Italy, assignor to A.T.B. S.p.A., Senago, Italy

Filed Mar. 27, 1979, Ser. No. 24,290

Claims priority, application Italy, Apr. 6, 1978, 22030 A/78; Jun. 1, 1978, 22008/78[U]

Int. Cl.⁴ G11B *5/74, 23/00*

U.S. Cl. 360—130.31 **4 Claims**



1. A magnetic tape backing leaf spring and pad assembly for providing back support for a running magnetic tape, comprising a resilient reed and a low friction coefficient pad, said reed having an intermediate portion defining a surface for securing thereon said pad, said pad having a thickness dimension extending perpendicular to said surface and a width dimension extending parallel to said surface, wherein said reed has at least one pair of opposite tooth formations punched out therefrom astride of said intermediate portion at a distance and opposite to each other and projecting from said reed transverse to said surface thereof, the extension of said tooth formations in a direction perpendicular to said surface being less than the thickness dimension of said pad and the distance between at least two opposite points of said tooth formations being less than said width dimension of said pad thereby to clamp said pad therebetween, wherein said opposite tooth formations have tips converging to each other thereby to penetrate into said pad and wherein said tooth formations taper towards their tips and wherein said reed has a progressively increasing width in the zone where said tooth formations are punched out therefrom thereby to compensate for the void space left by punched out tooth formations in the reed body.

4,573,096

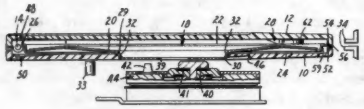
CLAM-SHELL CARTRIDGE FOR RECORDING DISC

Sten R. Gerfast, Mendota Heights, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Dec. 20, 1982, Ser. No. 451,037

Int. Cl.⁴ G11B *23/02*

U.S. Cl. 360—133 **7 Claims**



1. A cartridge for containing a recording disc having a rigid hub including a conical sealing surface, said cartridge comprising:

a rigid receptacle having a broad panel including a central drive-access opening providing a continuous conical seat adapted to sealingly receive said hub sealing surface;

a rigid cover hinged to the receptacle and movable between an open position and a closed position wherein said cover contacts (a) the receptacle along a continous path enclosing the recording disc and (b) a rigid portion of the disc which is integral with said hub to force said hub conical sealing surface into said receptacle conical seat; and

means outside said path for latching said rigid cover to said rigid receptacle to enclose said disc within a substantially dust-tight chamber defined by said contact along said path and said contact between said hub sealing surface and said receptacle conical seat.

4,573,097

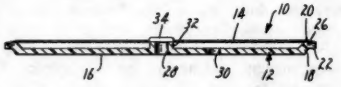
STRETCHED SURFACE RECORDING DISK AND METHOD OF MANUFACTURE

Sheldon L. Pastor, St. Paul, and John W. Louks, North St. Paul, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Oct. 13, 1982, Ser. No. 433,953

Int. Cl.⁴ G11B *5/82*

U.S. Cl. 360—135 **7 Claims**



1. A stretched surface recording disk comprising:

a disk-shaped base;

an annular upstanding rim attached to the perimeter of said base and terminating in a film reference surface defining a plane parallel to said base and spaced from said base for supporting said film in parallel spaced relationship of said base;

an annglar film bonding lip extending radially from adjacent said reference surface and away from the center of said base, said bonding lip including an inclined film bonding surface extending from said reference surface toward the plane of said base with said bonding surface terminating at a radially defined perimeter; and

a circular taut film stretched across said film reference surface and terminating within said radially defined perimeter and bonded to said film bonding surface so that said recording disk is contained completely within the radial perimeter of said film bonding lip.

4,573,098

GROUND VOLTAGE SUPPRESSION

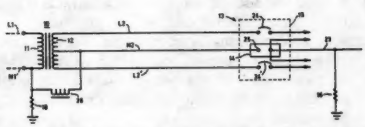
Dale B. Williston, 55 Shier Dr., Scarborough, Ontario, Canada (M1J 2G1)

Filed Oct. 25, 1983, Ser. No. 545,252

Claims priority, application Canada, Jul. 6, 1983, 431908

Int. Cl.⁴ H02H *9/04*

U.S. Cl. 361—42 **9 Claims**



1. In a power supply system including a distribution transformer having primary and secondary windings providing

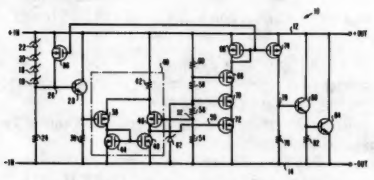
respective input and output terminals, one said input terminal being connected to true ground via a first ground connection and said output terminals being connected via line and neutral conductors to respective terminals of a service panel the neutral terminal being connected to true ground via a second ground connection, the improvement comprising non-linear impedance means formed by a saturating inductor connected between the neutral conductor and one said ground connection and defining with the latter a neutral-to-ground current path, said saturating inductor presenting a high impedance to current flow at applied voltages below a predetermined level and a low impedance to current flow at applied voltages above said predetermined level.

4,573,099

CMOS CIRCUIT OVERVOLTAGE PROTECTION

Apparajan Ganesan, and Ronald A. Morrison, both of Indianapolis, Ind., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jun. 29, 1984, Ser. No. 626,230
Int. Cl.[4] H02H 9/04
U.S. Cl. 361—56 **13 Claims**



1. Apparatus for protecting an electronic circuit from an overvoltage surge between positive and a negative supply voltage nodes, comprising:

a first vertical bipolar transistor having its emitter-collector path connected between the supply nodes;

a second vertical bipolar transistor having its emitter-collector path connected between one of the supply nodes and the base of the first vertical bipolar transistor;

a first resistor connected between the base of the first bipolar transistor and the other supply node, and

switching means responsive to an overvoltage condition between the supply nodes connected to the base of the second bipolar transistors for turning on the first and second bipolar transistors for the course of the overvoltage condition, the switching means including a latch circuit and a voltage sensing means which generates an activating voltage in response to an overvoltage, and

a comparator having two input nodes, one of the input nodes being coupled to the activating voltage and the other input node being coupled to the input of a bias voltage node.

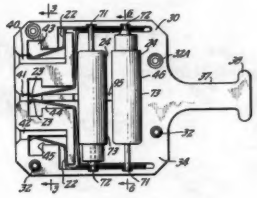
4,573,100

TELEPHONE TWO ELEMENT GAS TUBE PROTECTOR MODULE

Michael Fasano, Syosset, N.Y., assignor to Porta Systems Corp., Syosset, N.Y.

Filed May 7, 1984, Ser. No. 607,653
Int. Cl.[4] H02H 9/06
U.S. Cl. 361—119 **4 Claims**

1. A telephone protector module for use in protecting an individual subscribed pair comprising: a housing element including first and second generally planar mating members defining plural cavities therebetween; a pair of two element gas tubes disposed in mutually parallel relation within one of said cavities, first and second conductor contacts each having first terminals positioned in another of said cavities, and having a first end thereof extending to an opening in said casing element to selectively engage a pin contact communicating with one of said subscriber pair, and a second end of generally planar configuration and having a pair of openings extending through the plane thereof; at least one ground contact having a first terminal positioned in another of said cavities, and having a first end extending to an opening in said casing element to selectively engage a ground pin contact projectible into said housing element; said ground contact having a second end of generally planar configuration, said end having a pair of openings extending through the plane thereof; said second end of at least one conductor contact and said ground contact being disposed in congruent spaced relation; a thin insulative strip positioned between said last mentioned second ends and having openings therein aligned with the aligned openings in said second ends; said first and second gas tube elements being positioned between said second ends of each of said first and second conductor contacts and said at least one ground contact; each of said gas tube elements having oppositely directed pin contacts, engaging the openings in said conductor contacts, and passing through the opening in said at least one ground contact and said insulative strip; said outer housings of said gas tubes communicating with only one of said oppositely disposed pins; whereby current, under abnormal operating conditions may flow through one of said conductor contacts, and through the housing of a said gas tube to said at least one ground contact.

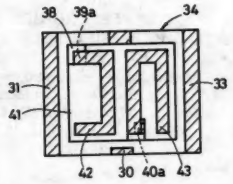


4,573,101

LC COMPOSITE COMPONENT

Selichi Takeno, Fukui, Japan, assignor to Murata Manufacturing Co., Ltd., Japan

Filed Jun. 25, 1984, Ser. No. 624,024
Claims priority, application Japan, Jun. 28, 1983, 58-99827[U]
Int. Cl.[4] H01G 4/10, 4/38
U.S. Cl. 361—321 **16 Claims**



1. An LC composite component comprising:

a laminated capacitor section provided on its end surface with at least two outer electrodes at positions different from each other;

an inductance element section superposed on said laminated capacitor section; and

a conductive path formed within said inductance element section, said conductive path extending from a predetermined outer electrode of said laminated capacitor section, wherein

said inductance element section includes a laminated sub-

stance comprising a plurality of layers obtained by solidifying paste containing sintered powder of magnetic or insulating ceramic material,

said conductive path includes a plurality of conductive patterns formed on said plurality of layers in said laminated substance, and

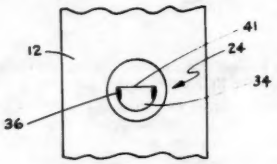
said plurality of conductive patterns extend within said inductance element section such that certain layers of said laminated substance are laminated in a state exposing end terminals of the conductive patterns arranged under the same, said conductive patterns arranged under the same being conductively connected with the conductive patterns formed on said layers at the exposed faces, thereby to produce an inductance component.

4,573,102

ELECTRICALLY ILLUMINATED ARTIFICIAL TREE

Dorothy Norwood, 15701 Morning Star, Maple Heights, Ohio 44137

Filed Dec. 5, 1983, Ser. No. 557,862
Int. Cl.⁴ F21P *1/02*
U.S. Cl. 362—123 **8 Claims**



1. An electrically illuminated artificial tree comprising:

a trunk body member having a plurality of angularly recessed branch receiving means positioned thereon;

a plurality of tree branches, each including a plurality of illuminating members and leaf members located at spaced intervals along the tree branches, a connecting means positioned at an end of the tree branches for electrically engaging said branch receiving means, and a means for electrically connecting said illuminating members to said connecting means;

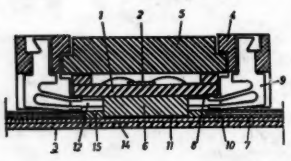
a support means having a means for supplying electrical current to said trunk body member and a means for electrically connecting said branch receiving means to said means for supplying electrical current, the means for electrically connecting including a plurality of insulated wires circuitously attached to the illuminating members, branch receiving means, and the means for supplying electrical current.

4,573,103

COOLING DEVICE FOR ELECTRONIC COMPONENTS CONNECTED TO A PRINTED CIRCUIT BOARD BY A HOLDER

Per-Ove Nilsson, Bandhagen, Sweden, assignor to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden

Filed Feb. 2, 1984, Ser. No. 576,123
Claims priority, application Sweden, Feb. 18, 1983, 8300921
Int. Cl.⁴ H05K *7/20*
U.S. Cl. 361—386 **5 Claims**



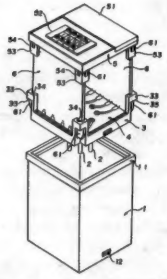
1. A cooling system combined with an electronic component removably mounted on a multilayer printed circuit board by holder, said cooling system comprising a heat conductive body inserted in the holder and metal heat transfer means incorporated within said board and comprising one of the layers thereof in a position so that with the holder engaging said board, the electronic component is in heat transfer contact with the heat conductive body and the latter is in heat transfer contact with said heat transfer means such that heat is transferred from the component to the heat conductive body and then to the heat transfer means incorporated in said board and comprising said one layer thereof, said board comprising a further layer having a recess in which said heat conductive body is received, said further layer including electrical conductors therein, said holder including electrical contact means establishing electrical contact between said electronic component and said electrical conductors on said further layer with the holder engaged with said board and said heat conductive body, wherein said electrical contact means includes resilient projections engaging said component and said board for establishing said electrical contact between the component and the electrical conductors, said heat conductive body including further projections engaged in grooves provided in said holder for securing said heat conductive body in said holder, and means securing said heat conductive body to said board.

4,573,104

ASSEMBLING CONSTRUCTION OF ELECTRONIC APPARATUS

Koichiro Kamada, Osaka, Japan, assignor to Omron Tateisi Electronics Co., Kyoto, Japan

Filed Dec. 20, 1983, Ser. No. 563,528
Claims priority, application Japan, Dec. 21, 1982, 57-193620[U]
Int. Cl.⁴ H05K *5/00*
U.S. Cl. 361—399 **6 Claims**



1. An assembly having electronic apparatus housed in a case having openings at both ends, comprising;

a pair of panels having a configuration corresponding to the configuration of said case openings, each panel having four pillar-like portions which are projectionly provided one on each of the four corners of the panel surface;

said each pillar-like portion having a guide groove and an engaging shoulder;

circuit boards, composed as a part of said electronic apparatus, integrally connecting said panels, each circuit board having engaging portions at four corners which are engagedly inserted into said pillar guide grooves and which come into abutment with said engaging shoulders for engagement;

said pillar-like portions being subjected to elastic distortion as said engaging portions are inserted into said guide grooves and resiliently returing to their original state to bring said engaging shoulders into abutment with said

engaging portions when said engaging portions are fully inserted into said guide grooves; and

said circuit boards and panels are inserted and housed in said case, whereby said panels cover said case openings and provide surfaces for mounting display panels, controls and/or external terminals of said electronic apparatus, respectively.

4,573,105

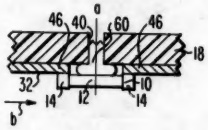
PRINTED CIRCUIT BOARD ASSEMBLY AND METHOD FOR THE MANUFACTURE THEREOF

Vitauts Beldavs, Indianapolis, Ind., assignor to RCA Corporation, Princeton, N.J.

Filed Feb. 16, 1983, Ser. No. 466,912

Int. Cl.[4] H05K *7/10, 3/20*

U.S. Cl. 361—403 **3 Claims**



1. In the method for soldering a leadless electronic component having a central portion and terminal end portions to a printed circuit board having solder pads separated by a predetermined width space wherein the leadless electronic component is initially adhesively secured to the printed circuit board with the terminal end portions in alignment with the solder pads and the resulting assembly is thereafter soldered, the improvement which comprises:

(a) forming an aperture through the printed circuit board at a location which is intermediate between the solder pads;

(b) applying a predetermined amount of a hardenable adhesive at about said location, said predetermined amount being sufficient to form an adhesive body extending from the central portion of a leadless electronic component positioned on said printed circuit board to a point substantially within the aperture formed in the printed circuit board but less than an amount which will allow the adhesive to contact the terminal end portions and solder pads;

(c) positioning said leadless electronic component on the printed circuit board whereby only the central portion of the leadless electronic component is contacted by the adhesive, and the adhesive extends to a point substantially within the aperture; and

(d) allowing the adhesive to harden whereby a hardened adhesive body is obtained which secures the leadless electronic component in position prior to and during soldering of the terminal end portions to the solder pads.

4,573,106

ILLUMINATED SLIDE RHEOSTAT

Junichi Kuratani, Miyagi, Japan, assignor to Alps Electric Co., Ltd., Japan

Filed Aug. 1, 1984, Ser. No. 636,582

Claims priority, application Japan, Aug. 1, 1983, 58-118635[U]

Int. Cl.[3] G01D *11/28*

U.S. Cl. 362—28 **3 Claims**

1. An illuminated slide rheostat comprising:

an upper baseplate and a lower baseplate both of which are made from a transparent material;

a lower sheet including a resistance layer;

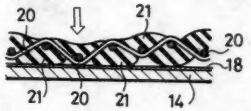
a pressure-sensitive sheet which, when pressed, cooperates with the resistance layer to form an electrically conductive path;

an upper sheet having electrodes which are electrically connected with the pressure-sensitive sheet;

an insulating sheet that insulates the resistance layer from the electrodes;

the lower sheet, the pressure-sensitive sheet, the upper sheet, and the insulating sheet being disposed between the upper baseplate and the lower baseplate;

an indicator portion formed in the upper baseplate and having a transparent region;



a guide member installed in the upper baseplate and extending straight;

a sliding body made from a transparent material fitted in the guide member in such a way that it can reciprocate;

a knob formed on the sliding body located adjacent the indicator portion; and

a pressure-applying member installed in the sliding member and sliding on the pressure-sensitive sheet.

4,573,107

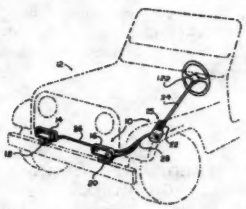
STEERABLE SPOTLIGHT ASSEMBLY

David Stock, 15249 Sobey Rd., Saratoga, Calif. 95070, and William Akers, 4137 Leigh Ave., San Jose, Calif. 95124

Filed Oct. 1, 1984, Ser. No. 656,323

Int. Cl.[4] B60Q *1/12*

U.S. Cl. 362—49 **17 Claims**



1. A steerable spotlight assembly for a vehicle having a steering wheel attached to a steering column, said assembly comprising:

at least one spotlight;

a spotlight rotating mechanism attaching said spotlight to said vehicle;

a steering column gear operationally attached around said steering column of said vehicle;

a cable drive mechanism including at least one cable drive gear, and biasing means for operationally biasing said cable drive gear against said steering column gear, said biasing means permitting said cable drive gear to disengage from said steering column gear when the torque required to rotate said cable drive gear exceeds a predetermined level; and

cable means coupling said cable drive gear to said spotlight rotating mechanism, whereby rotation of said steering wheel results in a corresponding rotation of said spotlight.

4,573,108

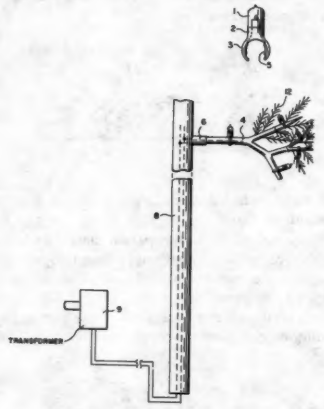
DECORATIVE LIGHTING SYSTEM

Robert Castiglia, and Helen Castiglia, both of 7 Linden La., Shirley, N.Y. 11967

Filed Oct. 26, 1984, Ser. No. 665,999

Int. Cl.[4] A47G *33/16*

U.S. Cl. 362—123 11 Claims



1. A lighting system for conducting an electrical current to lamps disposed on ornamental objects comprising:

elongated support track means having a pair of separated first electrical conductors separately disposed along its length; and

lamp means having C-shaped resilient clasp means including a pair of separately disposed second conductors connected to said lamp means, said second conductors having an alignment corresponding to said first conductors for frictionally engaging said support track means and electrically connecting said first conductors to said second conductors and said lamp means, said second conductors are flat conductors each disposed in the resilient C-shaped clasp means for making surface contact with said first electrical conductors.

4,573,109

BATTERY POWERED LAMP UNIT AND SUPPORTING CONTAINER

Andrew J. Lack, Preesall, England, assignor to Gladson Limited, Blackpool, England

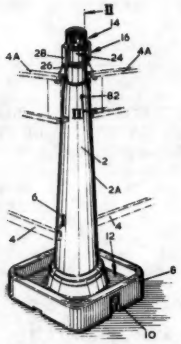
Filed Oct. 15, 1984, Ser. No. 661,185

Claims priority, application United Kingdom, Oct. 14, 1983, 8327642

Int. Cl.[4] F21L *27/00;* E01F *9/01*

U.S. Cl. 362—194 10 Claims

1. A battery powered lamp unit in combination with a supporting container, the combination comprising an integral unit comprising an electric lamp integral with a compartment to contain at least one electric battery to power said lamp and electrical circuit means whereby said lamp can be powered by the battery, a tubular supporting container having an open end into which the integral unit is insertable for support thereby with the container surrounding the compartment and the lamp projecting beyond said open end, locking means comprising engageable elements on the unit and interior of the tubular container such that said elements engage one with another some distance within the container from said open end when the unit is inserted so as to prevent removal of the unit, and said locking means being arranged to be unlocked by key means insertable into the tubular container to cause disengagement of



aforesaid engaged elements one from another so that the unit can be removed.

4,573,110

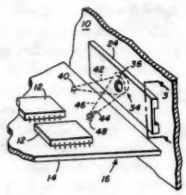
CONTROL DEVICE

Donald E. Drumm, Billerica, Mass., assignor to Wang Laboratories, Inc., Lowell, Mass.

Filed Sep. 28, 1984, Ser. No. 655,846

Int. Cl.[4] F21V *17/02*

U.S. Cl. 362—319 6 Claims



1. Apparatus for inputting a control signal from an operator situated outside of a cabinet to control some parameter of electrical circuitry mounted interior to said cabinet, comprising

a control handle supported on and extending outside said cabinet and movable by an operator through a range of positions,

a screen with a surface having non-uniform reflectivity, said screen being attached to said handle and moving therewith,

a window structure supported on said cabinet and defining a window exposing a part of said screen surface to view from the interior of said cabinet,

the part of the screen surface exposed to view through said window changing to expose regions of said screen surface with changing average reflectivity as said control handle is moved through said range of positions,

a source of light mounted interior to said cabinet so as to direct light through said window to illuminate the part of said screen surface in view,

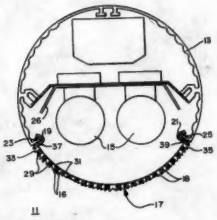
a light sensor mounted interior to said cabinet so as to have its field in view include said window,

said light sensor having an electrical output signal responsive to the amount of light the sensor receives and connected to control said parameter.

4,573,111
LINEAR LIGHT PASSING MEDIA HAVING CERTAIN STRIPED CHARACTERISTICS

Douglas J. Herst, 11 Upper Ames, Ross, Calif. 94957, and Peter Y. Y. Ngai, 1833 Fallbrook Dr., Danville, Calif. 94526

Filed Apr. 4, 1984, Ser. No. 596,811
Int. Cl.[3] F21V 5/00
U.S. Cl. 362—337 23 Claims



1. An improved linear light passing media for a linear luminaire having a luminaire housing and light source mounted in said housing, said media formed to extend longitudinally of said luminaire in a substantially uniform cross-sectional shape and comprising

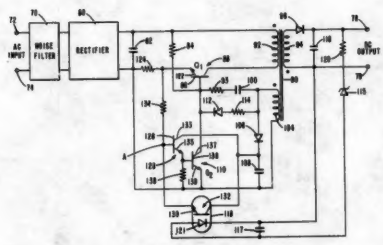
at least one longitudinally extending mounting edge, said mounting edge being formed for securement of said media to said luminaire housing in spaced relation to said luminaire light source,

said media having linear areas of media coloration extending longitudinally of said light passing media whereby said media, when illuminated by the light source in the luminaire's housing, presents to an observer of said media a longitudinal pattern of stripes on the surface thereof.

4,573,112
SWITCHING REGULATOR WITH A QUIESCENT TIME PERIOD

Kunio Numata, Fujisawa, and Yoshiaki Nishiyama, Hiratsuka, both of Japan, assignors to NCR Corporation, Dayton, Ohio

Filed Feb. 28, 1984, Ser. No. 584,377
Claims priority, application Japan, Apr. 25, 1983, 58-71549
Int. Cl.[4] H02M 5/45
U.S. Cl. 363—19 7 Claims



1. A switching regulator of the type having an input circuit for receiving an A.C. signal, a rectifier in series with the input circuit, first switching means connected in series with the input circuit and the primary winding of a transformer for transmitting the output of the rectifier to the primary winding of the transformer when enabled, the transformer having a reversed secondary winding connected to a diode and first and second output terminals of the regulator, the diode being operated upon the disabling of the first switching means to transmit the output of the rectifier from the secondary winding to the output terminals, the regulator further comprising;

second switching means connected to the first switching means for disabling said first switching means and enabling the output of the rectifier to be transmitted to the output terminals of the regulator upon operation of said second switching means;

means connected to said first switching means for supplying a biasing voltage to said second switching means for operating said second switching means after said first switching means has been enabled for a predetermined time period;

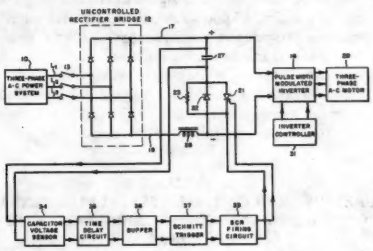
capacitor means connected to the output of the secondary winding in chargeable relation thereto, said capacitor means being discharged within a time period which varies in accordance with the level of the load applied to the output terminals;

and a control circuit including a photocoupler having an optical electronic coupling device diode portion connected in series to said capacitor means and a transistor portion connected in series with the second switching means and to said output terminals for sensing the voltage level of the rectifier output transmitted to the output terminals, said circuit further including a Zener diode connected in series with said capacitor means and said coupling device diode portion for enabling the capacitor means to supply a biasing voltage to said second switching means upon sensing a predetermined voltage level at said output terminals whereby the second switching means is operated to disable the operation of the first switching means during a time period which varies in accordance with the level of the load.

4,573,113
SURGE PROTECTION SYSTEM FOR A D-C POWER SUPPLY DURING POWER-UP

Bruce K. Bauman, Glen Rock, Pa., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Jan. 26, 1984, Ser. No. 574,301
Int. Cl.[4] H02M 7/06
U.S. Cl. 363—48 1 Claim



1. A surge protection system for a d-c power supply wherein a-c line voltage, received from an a-c power distribution system, is rectified in an uncontrolled rectifier bridge to develop a d-c voltage which is then filtered and smoothed in a low pass filter having a series-connected filter inductor and a shunt-connected filter capacitor, said surge protection system comprising:

a resistance, connected in series with the filter capacitor, for limiting the inrush current flowing to the capacitor and the overshoot voltage produced across the capacitor during the power-up period;

and control means for essentially bypassing said resistance at the conclusion of the power-up period and including a sensor for sensing the filter capacitor voltage and producing a scaled-down replica of that voltage, a time delay circuit for delaying the replica voltage, and a triggering circuit for turning on a solid state switch to short out said resistance when the replica voltage reaches a preset level, which level

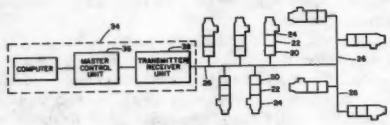
indicates that the filter capacitor is fully charged and that the power-up period is concluded.

4,573,114

VALVE CONTROL UNIT AND SYSTEM FOR USE THEREWITH

Gary L. Ferguson, Cedar Rapids, and Carl H. Meier, Davenport, both of Iowa, assignors to Cherry-Burrell, Cedar Rapids, Iowa

Filed Oct. 21, 1983, Ser. No. 544,451
Int. Cl.[4] G06F *15/46;* G05B *15/02*
U.S. Cl. 364—138 **6 Claims**



1. A plurality of valve control units each adapted to be carried by a valve which is movable between a first predetermined position and a second predetermined position for controlling operation of its corresponding valve in accordance with instructions from a controller remote from said valves and reporting to said controller the position of its valve, each valve control unit comprising:

connector means for making connection with a cable interconnected with said controller, said cable including a pair of conductors for carrying an A.C. voltage, a conductor for carrying a digital synchronization signal generated by said controller, a conductor for carrying a digital command signal generated by said controller, and a conductor for carrying a digital position indication signal generated by said control units;

sensor means for detecting the position of the valve;

solenoid means for causing movement of the valve;

microprocessor means responsive to said synchronization signal and said command signal to effect energization and deenergization of said solenoid means, said microprocessor being responsive to said sensor means to contribute to said position indication signal; and

power supply means connected to receive said A.C. voltage and providing a first D.C. voltage for energizing said solenoid means and a second D.C. voltage for providing a control voltage for said microprocessor means.

4,573,115

SUPERVISORY CONTROL SYSTEM FOR REMOTELY MONITORING AND CONTROLLING AT LEAST ONE OPERATIONAL DEVICE

Edwin A. Halgrimson, Naperville, Ill., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Filed Oct. 28, 1983, Ser. No. 546,622
Int. Cl.[4] G06F *15/46*
U.S. Cl. 364—138 **12 Claims**

1. A supervisory control system comprising:

(a) at least one microremote in operative communication with outputs associated with an operational device, the microremote comprising:

input means for receiving a signal representative of a parameter associated with the operational device, and

logic circuit means for controlling the operation of the microremote;

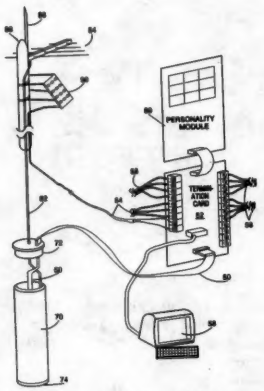
(b) a microcomputer in communication with the microremote by a communication link; the microcomputer comprising:

means for receiving the signal from the microremote;

memory means for storage of at least one algorithm; and

microprocessor means for controlling the operation of the microcomputer and for utilizing the signal from the microremote in conjunction with the algorithm for operation of the supervisory control system; and

(c) at least one personality module in communication with the microcomputer, the personality module comprising:



memory means having at least one algorithm stored therein for communication to the memory means of the microcomputer, and

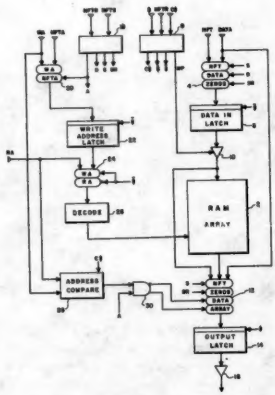
logic circuit means for controlling the operation of the personality module.

4,573,116

MULTIWORD DATA REGISTER ARRAY HAVING SIMULTANEOUS READ-WRITE CAPABILITY

Richard H. Ong, Phoenix; Peter C. Economopoulos, Scottsdale, and Russell W. Guenthner, Glendale, all of Ariz., assignors to Honeywell Information Systems Inc., Phoenix, Ariz.

Filed Dec. 20, 1983, Ser. No. 563,350
Int. Cl.[4] G06F *1/00*
U.S. Cl. 364—200 **4 Claims**



1. In a digital computer system, a multiword data register comprising:

a RAM array memory unit having a plurality of rows and a plurality of columns of cross-coupled transistor CML memory cells;

data input terminal means;

data input logic means connected between said data input terminal means and corresponding columns of said RAM array memory unit;

a clock signal means providing a strobe signal having a cyclic configuration with a positive half cycle and a negative half cycle;

a write-address input means connected to receive write-address signals;

a read-address input means connected to receive read-address signals;

an address selector switch means having said write-address signals applied to a first input thereof and having said read-address signals applied to a second input thereof, said address selector switch means being connected to be responsive to said strobe signal to provide selectively an output signal corresponding to said write-address signal during a first half cycle of said strobe signal and an output signal corresponding to said read-address signal during a second half of said strobe signal;

a signal decoder means connected between said selector switch means and said RAM array to effect the addressing of a single row of said memory cells in accordance with the selected address;

output circuit means including an output selector switch means, said output selector switch means having signals from an addressed row of said RAM array connected to a first input thereof and having said data input terminal means connected to a second input thereof; and

an address comparator connected to said write-address input means and to said read-address input means, said comparator including means to produce comparator output signals indicative of the identity or difference of said write-address signals and said read-address signals;

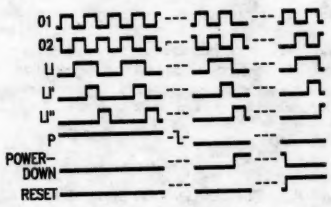
said output selector switch being connected to be responsive to said output signals from said comparator to select said data input signals when said compared address signals are identical and to select RAM array signals when said compared addresses are different.

4,573,117

METHOD AND APPARATUS IN A DATA PROCESSOR FOR SELECTIVELY DISABLING A POWER-DOWN INSTRUCTION

Joel F. Boney, Austin, Tex., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Nov. 7, 1983, Ser. No. 549,957
Int. Cl.[4] G06F *1/04*
U.S. Cl. 364—200 **5 Claims**



1. In a data processor comprising:

oscillator means for providing a periodic clock signal except in response to receiving a power-down signal;

reset means for providing a reset signal in response to a predetermined condition; and

instruction execution control means, operative in synchronism with said clock signal, for receiving each of a plurality of different instructions comprising an instruction stream, and, in response to receiving a predetermined power-down instruction in said instruction stream, providing said power-down signal to said oscillator means to terminate said clock signal until said reset means next provides said reset signal, said instruction execution control means proceeding to a next instruction in said instruction stream only upon resumption of said clock signal;

a circuit for selectively disabling said power-down instruction, comprising:

control register means for storing a predetermined control code in response to said instruction execution control means receiving a different predetermined one of said instructions in said instruction stream; and

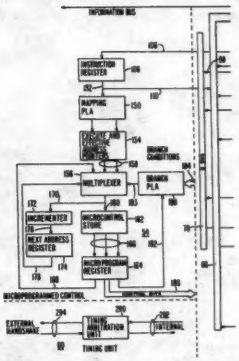
logic means responsive to said control code being stored in said control register means, for preventing said instruction execution control means from providing said power-down signal to said oscillator in response to said power-down instruction, whereby said instruction execution control means will simply proceed to said next instruction in said instruction stream.

4,573,118

MICROPROCESSOR WITH BRANCH CONTROL

Nabil G. Damouny, Sunnyvale, and Min-Siu Huang, Mountain View, both of Calif., assignors to Fairchild Camera & Instrument Corporation, Mountain View, Calif.

Filed Mar. 31, 1983, Ser. No. 481,061
Int. Cl.[4] G06F *9/00*
U.S. Cl. 364—200 **10 Claims**



1. A microprocessor including a pipelined path for flow of instructions in said microprocessor, which comprises a microcode address multiplexer connected to supply addresses from a plurality of different inputs to a microcode storage means, said microcode storage means being connected to supply microcode, in response to the addresses to a microcode register, said microcode register being connected to supply branch control information to a branch control means, said branch control means being connected to receive branch condition inputs externally of said microprocessor, internally of said microprocessor and from a microcode address programmable logic array, said microcode address programmable logic array being connected to supply microcode addresses to said microcode address multiplexer, said branch control means being connected to control operation of said microcode address multiplexer.

4,573,119

COMPUTER SOFTWARE PROTECTION SYSTEM

Thomas O. Westheimer, 2 Highland Dr., Peterborough, N.H. 03458, and Peter D. Hipson, 4 S. Shore Dr., Jaffrey, N.H. 03452

Filed Jul. 11, 1983, Ser. No. 512,218
Int. Cl.[4] G06F *12/14*
U.S. Cl. 364—200 **11 Claims**

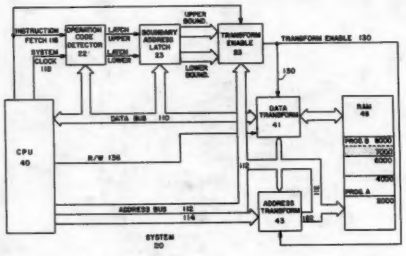
1. In a digital computing system including a central process-

ing unit (CPU) capable of writing data to and reading data from a random access memory (RAM), which RAM is capable of storing and putting out data as a plurality of digitally addressable words under control of said CPU, and which CPU and RAM are connected by a common data bus for transfer of data words and a common address bus for transfer of address words, an improved data access limitation and protection subsystem for protecting data stored within software selectable boundaries of said RAM from unauthorized access by selective transformation and substitution of data and address words as enabled upon detection of a predetermined transformation control sequence in which a unique operation code word is followed by memory address upper and lower boundary words defining said boundaries, said subsystem comprising:

operation code detector means connected to said CPU and to said data bus for detecting said unique operation code word stored in said RAM and fetched by said CPU and for putting out an operation-code-present signal when said unique operation code word is detected;

address latch means connected to said operation code detector means and to said data bus for storing an upper boundary address word and a lower boundary address word put out by said CPU when said address latch means is enabled by said operation-code-present signal from said operation code detector means;

address comparator means connected to said CPU, to said address bus and to said address latch means for comparing digital addresses subsequently put out by said CPU with



said stored boundary addresses and for putting out a transform enable signal upon determination that a said address put out by said CPU lies within a range defined by said boundary addresses as the result of said comparison;

address transformation means connected to said address bus between said RAM and said CPU and responsively connected to said address comparator means and enabled by said transform enable signal for transforming said digital addresses lying between said boundary addresses into different digital addresses in accordance with a predetermined address word transform;

bi-directional data transformation means connected to said data bus between said RAM and said CPU and responsively connected to said address comparator means and enabled by said transform enable signal for encoding data words as said words are written to said RAM by said CPU and for decoding bytes of data as said words are read from said RAM by said CPU in accordance with a predetermined data word transform;

whereby whenever said transform enable signal is put out by said address comparator means a word of data written by said CPU to said RAM is encoded by said data transformation means, and a word of data fetched by said CPU from said RAM is decoded by said data transformation means, and the digital address location to which said word of data is written and from which said word of data is fetched is different than the untransformed digital address generated and put out by said CPU.

4,573,120

I/O CONTROL SYSTEM FOR DATA TRANSMISSION AND RECEPTION BETWEEN CENTRAL PROCESSOR AND I/O UNITS

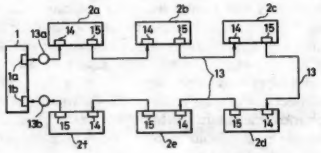
Yoshichika Ichimiya, Tokorozawa; Tsuneta Sudo, Kodaira; Turo Takehisa, Gyoda, and Katsumi Shimada, Saitama, all of Japan, assignors to Takeda Riken Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 195,078, Oct. 8, 1980, abandoned. This application Nov. 1, 1983, Ser. No. 547,461

Claims priority, application Japan, Oct. 19, 1979, 54-135531

Int. Cl.⁴ G06F *13/14, 13/38*

U.S. Cl. 364—200 **15 Claims**



1. An I/O control system comprising:

a central processing unit with input and output ports for respectively transmitting and receiving control commands and data;

a plurality of I/O units, each for performing data transmission and reception between it and the central processing unit in accordance with said control commands from the central processing unit, and each having an input port and an output port; and

a transmission bus for cascade connecting said input and output ports of said I/O units with each other and with said input and output ports of the central processing unit, the bus comprising a plurality of one-way data lines for transmitting on a time shared basis a control command signal for providing each said control command, an address signal for selecting each respective I/O unit and respective data signal, a plurality of tag lines for transmitting a respective tag signals indicating which of said control command, address and data signals is being sent out on the data lines, and a clock line for transmitting a reference clock signal in correspondence with said control command, address, data and tag signals;

wherein said one-way transmission bus includes a respective segment connecting internally between the input and output ports of each said I/O unit, each said input port of each said I/O unit includes a respective receiver for each of said data, tag and clock lines, each said output port of each said I/O unit includes a respective driver for each of said data, tag and clock lines, and the output of each said receiver is connected to the input of the respective driver for each of said data, tag and clock lines of each respective I/O unit.

4,573,121

METHOD FOR DETERMINING OPTIMUM THICKNESS OF OPHTHALMIC LENS

Tsuyoshi Saigo, Tokyo, and Akira Kitani, Fussa, both of Japan, assignors to Hoya Lens Corporation, Tokyo, Japan

Filed Jun. 6, 1983, Ser. No. 501,711

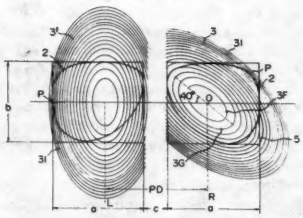
Claims priority, application Japan, Sep. 24, 1982, 57-165118

Int. Cl.⁴ G02C *7/02, 13/00*

U.S. Cl. 364—413 **4 Claims**

1. A method for determining the optimum thickness of an ophthalmic lens for a specified spectacle which comprises generating an equi-thickness line drawing of the contour of an ophthalmic lens based on a doctor's prescription for the lens, each of said equi-thickness lines being representative of a predetermined pitch and enveloping the optical center of the lens; superimposing on said drawing an outline of the frame of the

spectacle in an orientation determined by the doctor's prescription; identifying the outermost equi-thickness line within the boundaries of said frame; and determining the optimum thickness of the ophthalmic lens, based on the number of equi-thickness lines between the optical center of said lens and the identified outermost equi-thickness line, inclusive.

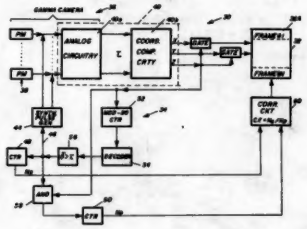


4,573,122

METHOD OF AND MEANS FOR COMPENSATING FOR THE DEAD TIME OF A GAMMA CAMERA

Dan Inbar, Haifa, and Alexander Ganin, Kiryat Bialick, both of Israel, assignors to Elscint, Ltd., Haifa, Israel

Continuation of Ser. No. 160,942, Jun. 19, 1980, Pat. No. 4,369,495. This application Nov. 4, 1982, Ser. No. 439,221
Int. Cl.⁴ G01T *1/20*
U.S. Cl. 364—414 **16 Claims**



1. A gamma camera for recording a representation of a frame of a dynamically changing radiation field that produces stimuli comprising:

(a) a camera head having an array of photodetectors for producing a group of input signals in response to an actual interaction of a stimulus with the head;

(b) a synthetic signal generator for generating a group of one or more synthetic signals that resemble said input signals and simulate the occurrence of a synthetic interaction of a stimulus with the head at a predetermined location;

(c) a processing circuit responsive to either a group of input signals or a group of synthetic signals for producing a group of output signals;

(d) coordinate computation circuitry responsive to a group of output signals of the processing circuit for calculating the coordinates of an interaction, actual or synthetic, causing the output signals;

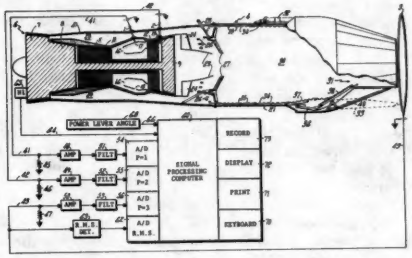
(e) means for distinguishing between a real interaction and a synthetic interaction independently of the location of the interaction.

4,573,123

ELECTROSTATIC ENGINE DIAGNOSTICS WITH ACCELERATION RELATED THRESHOLD

David M. Rosenbush, Granby, Conn., and Robert P. Couch, Palm Beach Gardens, Fla., assignors to United Technologies Corporation, Hartford, Conn.

Filed Dec. 28, 1982, Ser. No. 453,962
Int. Cl.⁴ G01M *15/00*
U.S. Cl. 364—431.02 **2 Claims**



1. Electrostatic diagnostic apparatus for an operating gas turbine engine, comprising:

electrostatic signal means, including a probe to be disposed in the gas stream of an engine, for providing, when said probe is disposed in the gas stream of an operating engine, a probe signal having a waveshape defined by amplitude variations thereof across a time interval of a given duration in response to electrostatic charge flowing in the gas stream in the vicinity of said probe;

speed means connected for response to the rotary speed of said engine to provide a speed signal indicative thereof;

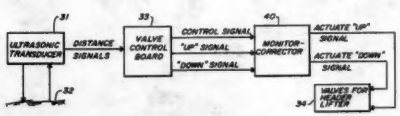
signal processing means connected for response to said electrostatic signal means and to said speed means, responsive to said speed signal for providing a threshold signal indicative of a threshold amplitude as a function of the rate of change of speed of the engine, and for providing a signal indicative of the characteristics of amplitude variations in said probe signal in response to said amplitude variations exceeding said threshold amplitude.

4,573,124

HEIGHT CONTROL FOR AGRICULTURAL MACHINE

James E. Seiferling, Rio Vista, Calif., assignor to Blackwelders, Rio Vista, Calif.

Filed Jan. 9, 1984, Ser. No. 569,207
Int. Cl.⁴ A01D *75/28*
U.S. Cl. 364—424 **36 Claims**



5. An agricultural machine including in combination:

a wheel-supported main frame,

a machine element movable relatively to said main frame, and having an initial position,

power means on said frame for moving said element up and down relatively to said main frame in small incremental steps, to vary the distance between a portion of said element and ground level,

distance-determining means mounted on said element for determining the distance between itself and ground level and for generating electrical signals corresponding to such distance,

a control circuit supported by said frame, receiving said signals and providing "up" pulses and "down" pulses according to whether said distance is decreasing or increasing, said control circuit including

a monitor-corrector having a counter preset for a predetermined number of enabling "down" pulses and having a pulse input for said "down" pulses, a pulse output, a reset, and output enabling means for enabling said pulse output only when said predetermined number of enabling "down" pulses is applied to said pulse input before the reset is actuated,

time delay means for actuating said counter reset after a short predetermined time interval,

a "down" actuator AND gate connected to said control circuit and normally enabled to pass a "down" pulse,

a "down" actuator switch actuated by said "down" actuator AND gate,

"down" applying means for applying each "down" pulse to said "down" actuator AND gate, to said pulse input, and to said time delay means to initiate said predetermined time interval,

an "up" actuator AND gate connected to said control circuit, normally enabled to pass an "up" pulse,

an "up" actuator switch connected to the output from said "up" actuator AND gate,

"up" applying means for applying each "up" pulse to said counter reset to enable said counter,

first and second one-shot multivibrators connected in series to the output from said counter and including a time delay in said second one-shot multivibrator, each said multivibrator having output means,

override means connected to the output means of said first one-shot multivibrator and to said "up" actuator switch for sending an "up" pulse to said power means upon actuation of said first multivibrator, and

disabling means connected to said output means of said second one-shot multivibrator and to both said AND gates to disable further actuation of both said "up" actuator AND gate and said "down" actuator AND gate for a predetermined time interval.

4,573,125

FLIGHT CONTROL SYSTEM ESPECIALLY FOR HELICOPTERS

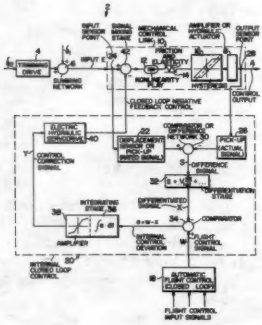
Herbert Koenig, Munich, Fed. Rep. of Germany, assignor to Messerschmitt-Boelkow-Blohm Gesellschaft mit beschraenkter Haftung, Munich, Fed. Rep. of Germany

Filed Mar. 28, 1983, Ser. No. 479,572

Claims priority, application Fed. Rep. of Germany, Apr. 7, 1982, 3212950

Int. Cl.[4] B64C *13/00*

U.S. Cl. 364—434 **11 Claims**



1. A flight control system, especially for helicopters, comprising mechanical control link means **(10)** having inherent destabilizing characteristics and including an input (E) and an output (A), internal control circuit means **(20)** for providing a control correction signal (y), said internal control circuit means comprising first pick-up means **(22)** operatively connected to the input (E) of the mechanical control link means **(10)** for providing a first input signal value derived from the input of said mechanical control link means **(10)** to said internal control circuit means **(20)**, second pick-up means **(26)** operatively connected to the output (A) of the mechanical control link means **(10)** for providing a measured output signal value derived from the output of the mechanical control link means **(10)** as a second signal input value to said internal control circuit means **(20)**, signal combining means **(42)** operatively connected between said input (E) and said output (A) for receiving said first input signal value and said control correction signal (y), said internal control circuit means **(20)** further comprising signal processing means for producing a combined signal (s) derived from said first and second input signal values provided by said first and second pick-up means **(22, 26)**, control drive means **(40)** having an output connected to said signal combining means **(42)** and a control input, and signal integrating means **(36)** operatively connected in series between said signal processing means and said control input of said control drive means **(40)** for supplying said control correction signal (y) as an integrated signal derived from said combined signal (s) through said control drive means **(40)** to said signal combining means **(42)** for neutralizing said destabilizing characteristics.

4,573,126

PROCESS AND DEVICE FOR MEASURING THE STATE OF CHARGE OF AN ELECTROCHEMICAL GENERATOR WHILE OPERATING

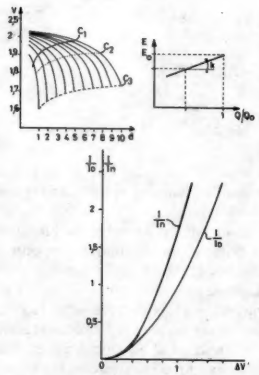
Jean-Paul Lefebvre, 10, Rue de Fief, 77930 Cely en Biere, France, and Thierry Pedron, Meylan, France, assignors to Regie Nationale des Usines Renault, Boulogne-Billancourt and Jean-Paul Lefebvre, Cely en Biere, both of, France

Filed Mar. 17, 1983, Ser. No. 476,312

Claims priority, application France, Mar. 17, 1982, 82 04493

Int. Cl.[4] G01R *13/02;* **G06F** *15/56*

U.S. Cl. 364—481 **15 Claims**



1. A process for measuring the state of charge of an electrochemical generator formed of at least one cell during charging or discharging of the generator, comprising:

measuring a no-load voltage V_M of the generator during an initial connection thereto, said no-load voltage V_M corresponding to an electromotive force E(to) at time to of said initial connection;

selectively charging or discharging said generator;

measuring the voltage Vb during selective charging or dis-

charging of the generator at a time t_1, and computing a difference $\Delta V = E(to) - Vb$;

computing a value of the electromotive force $E(t_1)$ of the generator representing its state of charge at time t_1 as a function of the difference ΔV and its electromotive force E(to) at time to, wherein $E(t_1)$ is computed according to the relation

$$E(t_1) = E(to) - f(\Delta V) \cdot \tau,$$

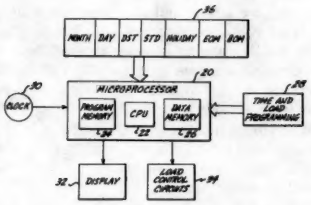
in which $f(\Delta V)$ is a predetermined law which, for a given type of generator, is independent of the nominal capacity of the generator and depends on the number of cells which make up the generator and on the sign of the difference ΔV which is positive at discharge and negative at charge, and τ is the elapsed time between times to and t_1.

4,573,127

PROGRAMMABLE ELECTRONIC REAL-TIME LOAD CONTROLLER, AND APPARATUS THEREFOR, PROVIDING FOR UPDATING OF PRESET CALENDAR EVENTS

William W. Korff, Seattle, Wash., assignor to Butler Manufacturing Company, Kansas City, Mo.

Filed Dec. 23, 1982, Ser. No. 452,627
Int. Cl.⁴ G01R *21/00*; G06F *15/20, 15/56*
U.S. Cl. 364—493 **17 Claims**



1. In an electronic controller that includes at least one load control circuit for controlling the energization state of a corresponding electrical load, and, a data processor operating under control of a stored program for: accumulating real-time information representing the numeric day, month and year of real-time; storing a predetermined schedule for control of the load; comparing its predetermined schedule for load control with its real-time information; causing the load control circuit to control the energization state of the load in accordance with that comparison; storing at least one calendar event by its numeric day and its numeric month, the calendar event being of the type that always occurs on the same alphabetic day always having the same relationship to the beginning or end of the same month in any year; comparing the stored numeric day and numeric month of the calendar event with its real-time information; and, undertaking a predetermined control action relating either to its real-time information or to its schedule for load control upon the occurrence in real-time of the stored numeric day and numeric month of the calendar event, the improvement wherein the data processor is operative to:

select, as a reference day, the numeric day of the calendar event in a given year;

select, as a reference year, the numeric year of said given year; and,

update the stored numeric day of the calendar event by periodically:

(a) determining the real-time numeric year from its real-time information;

(b) determining a temporary numeric day for the calendar event by decrementing said reference day in relation to the number of leap years and nonleap years that have elapsed between said reference year and said real-time year;

(c) determining a numerical limit for the numeric day of the calendar event in view of the relationship of the corresponding alphabetic day to the beginning or end of the month in which the alphabetic day occurs;

(d) comparing said temporary numeric day with said numerical limit and adjusting said temporary numeric day so that said temporary numeric day falls within said numerical limit; and,

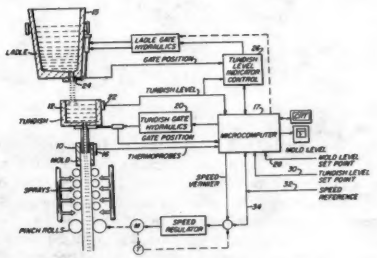
(e) storing said temporary numeric day as the numeric day of the calendar event for said real-time year.

4,573,128

DIGITAL METHOD FOR THE MEASUREMENT AND CONTROL OF LIQUID LEVEL IN A CONTINUOUS CASTING MOLD

Chester C. Mazur, White Oak, Pa., assignor to United States Steel Corporation, Pittsburgh, Pa.

Filed Mar. 31, 1983, Ser. No. 480,988
Int. Cl.⁴ G01F *23/00*; B22C *19/04*
U.S. Cl. 364—509 **2 Claims**



1. A method of measuring and controlling the level of an elevated temperature liquid in a container, said method comprising:

(a) converting to digital form the electrical voltage signal outputs of a plurality of temperature sensing means located at spaced elevations on a wall of said container above and below the expected level of liquid therein, said electrical signal outputs being indicative of the temperature profile along said wall due to the liquid in the container;

(b) periodically scanning the converted signals in periodically scanning the converted signals of the temperature sensing means in sequence with respect to the location of said sensing means on the wall of the container;

(c) determining from the scanned signals the location of the uppermost sensing means, n, having a converted signal value, Sn, of magnitude indicative of a temperature below the liquid level in the container;

(d) calculating a fraction, F, of the spacing between the sensing means, n, and the next above sensing means, n−1, at which the measured liquid level lies, said fraction being determined by the relation $F = (S_{n-1} - So)/(Se - So)$ wherein S_{n-1} is the converted signal value of the n−1 sensing means, Se is a converted signal value at a location where the liquid level is estimated to lie, Se being calculated as a function $Se = p \times m$ where p has a value within the range from 0.50 to 0.90 and m is the average of at least one of the largest converted signal values on each scan; and, So is calculated as a function $So = c \times m$ on an initial scan where c has a value within the range from 0 to 0.50 and is less than p; So being reset on subsequent scans at (i) Sn−1 whenever Sn falls within the range of values from Se to a value at a predetermined percentage greater than Se and (ii) Sn−2 whenever Sn falls within the range of values from Se to a value at a predetermined percentage less than Se, so as to avoid negative values of F due to changes of the level of liquid in the container;

(e) calculating the measured liquid level from, n, and, F, with respect to their location on said container; and

(f) controlling addition and discharge of liquid to and from said container based on said measured liquid level.

4,573,129

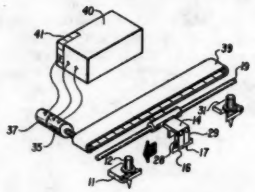
AUTOMATIC PEN-SENSOR

David C. Tribolet, and David L. Paulsen, both of San Diego, Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Continuation of Ser. No. 606,552, May 4, 1984, abandoned, which is a continuation of Ser. No. 352,405, Feb. 25, 1982, abandoned. This application Aug. 27, 1984, Ser. No. 645,512

Int. Cl.[4] G06K *15/40*

U.S. Cl. 364—520 **11 Claims**



1. An apparatus for sensing presence of one or more pens in a plotter, comprising:

stable means for holding a stable pen, including a back plate, an orthogonal side plate connected thereto and a stable arm connected to the side plate, the stable arm being arcuately movable in an X-Y plane for holding the stable pen against the back and side plates, the stable arm being positioned at an empty position during non-presence of the stable pen and at a full position during presence of the stable pen;

the empty position being located at first X- and Y-coordinates on orthogonal X- and Y-axes of the X-Y plane;

the full position being located at second X- and Y-coordinates;

holder means for holding a plotting pen, the holder means being X-axis movable and including a Y-axis movable holder arm for holding the plotting pen against a holder plate, the holder arm being positionable at the first Y-coordinate during non-presence of the plotting pen and at the second Y-coordinate during presence of the plotting pen;

drive means, coupled to the holder means, for causing X-axis motion of the holder means and for urging the holder means into contact with the stable means;

measuring means, coupled to the holder means, for measuring a stall X-coordinate of the holder means when the holder means is in contact with the stable means; and

logic means, coupled to the measuring means, for determining presence or non-presence of the stable and plotting pens from the stall X-coordinate.

4,573,130

INSTALLATION FOR MONITORING AND CONTROLLING A PRODUCTION MACHINE

Emile J. L. Groult, Vaux Le Penil Melun, France, assignor to Cofadis S.A., Marigny, France

Filed Sep. 28, 1982, Ser. No. 425,499

Claims priority, application France, Oct. 21, 1981, 81 19775

Int. Cl.[4] G06F *15/20*

U.S. Cl. 364—552 **6 Claims**

1. An installation for monitoring a printing machine to determine the total printed items and the rejected printed items while controlling said printing machine to produce a predetermined number of acceptable printed items comprising:

counting and sensing means associated with said printing machine and operable to count the number of items produced and provide corresponding output data;

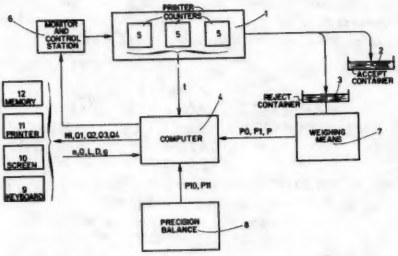
a weighing means for supplying the weight of said rejected printed items;

a precision weighing means for determining the mean weight of an item produced;

a keyboard, for inputting operating operating data;

display means;

computing means connected to said counting and sensing means, said weighing means, said precision weighing means, said keyboard and said display means and on the basis of data supplied by the counting and sensing means, the weighing means and the precision weighing means supplying the display means with the number of items produced, the number of items rejected, and the number of acceptable items as determined by the difference between the number of items produced and the number of items rejected; and,



control means connected to said computer means and said printing machine to control stopping of said printing machine once the predetermined number of acceptable printed items are printed.

4,573,131

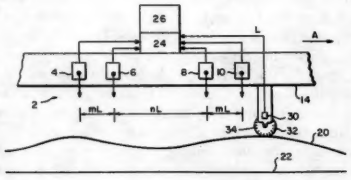
METHOD AND APPARATUS FOR MEASURING SURFACE ROUGHNESS

John Corbin, 9707 Barlow Rd., Fairfax, Va. 22031

Filed Aug. 31, 1983, Ser. No. 528,268

Int. Cl.[4] G01B *7/34*; G06F *15/20*

U.S. Cl. 364—554 **35 Claims**



1. A method of measuring surface roughness comprising the steps of:

(a) spacing a plurality of sensors along said surface at predetermined distances apart from one another, each of said sensors generating sensor-surface distance data, said spacing sleected such that the response characteristic of said plurality of sensors is non-zero for all wavelengths of surface roughness in excess of a predetermined folding wavelength,

(b) relatively moving said sensors and said surface,

(c) while relatively moving said sensors, sampling data from sensors at fixed sample distance intervals L,

(d) storing data from said sensors measured over a region of said surface,
(e) converting said data into second finite difference data over said region,
(f) converting said second finite difference data into data representative of a space curve of said surface, and
(g) displaying said space curve representative data to provide an indication of surface roughness.

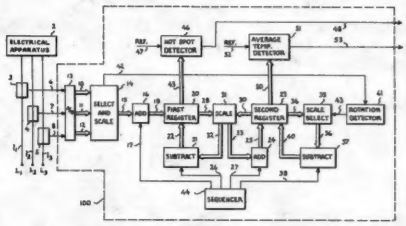
32. Apparatus for measuring surface roughness comprising:
(a) a support,
(b) at least two sensors coupled to said support,
(c) means for relatively moving said support and surface to thereby move said sensors longitudinally along said surface,
(d) means for sampling data outputs from said sensors at longitudinal distance intervals L,
(e) said sensors responsive to surface roughness by measuring the component relative displacement of said sensors and surface in a direction perpendicular to said longitudinal relative motion direction,
(f) means for coupling said sensors to said surface to enable said sensors to respond to said component relative displacement at first, second, third and fourth points spaced longitudinally along the direction of longitudinal relative motion,
(g) said first and second points spaced apart by a distance mL, said second and third points spaced apart by a distance nL, and said third and fourth points spaced apart by a distance mL, m and n being integers having no common factors,
(h) data processing means for processing said data outputs, said data processing means comprising a programmable digital computer operable for:
(i) weighing data outputs of said sensors to form a first asymmetric cord offset (ACO) measurement defined by the point displacements m, n corresponding to a first ACO configuration for said first, second and third points,
(ii) weighing data outputs of said sensors to form a second ACO measurement defined by the point displacements m, n corresponding to a second ACO configuration for said second, third and fourth points, said first and second ACO configurations being mirror images of one another about a plane midway between said second and third points, said first and second ACO measurements being insensitive to rigid body motion of said support,
(iii) combining said first and second ACO measurements to form a first mid-cord offset (MCO) measurement corresponding to hypothetical points having relative displacements defined by m=n=1, and
(iv) converting said first MCO measurement into data representative of a space curve of said surface, and
(i) means for displaying said space curve representative data to provide a measure of surface roughness.

4,573,132
THERMAL MODEL FOR ELECTRICAL APPARATUS

David R. Boothman, Ennismore, and John C. Forde, Peterborough, both of Canada, assignors to Canadian General Electric Co. Ltd., Toronto, Canada

Filed Apr. 25, 1983, Ser. No. 488,449
Claims priority, application Canada, May 7, 1982, 402483
Int. Cl.⁴ G06F *15/20;* H02H *7/08*
U.S. Cl. 364—557 **20 Claims**

1. Apparatus for providing a thermal model of an electric apparatus which has current-carrying conductors and a core material comprising:
(a) first and second registers for storing respectively digital values representing conductor temperature and core material temperature;
(b) means for deriving, with respect to said conductors, a first digital signal representing current in said conductors and periodically adding said first digital signal to the value in said first register;
(c) means for receiving the values stored in said first and second registers to obtain a difference representing the temperature difference between the conductors and the core material and, in response thereto, determining second and third digital signals representing heat transferred from the conductors;

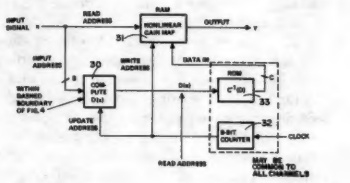


(d) means for periodically subtracting said second digital signal from the value in said first register;
(e) means for periodically adding said third digital signal to the value in said second register; and,
(f) means for receiving the value stored in said second register and determining a fourth digital signal representing heat transferred from said second register.

4,573,133
SIGNAL PROCESSOR FOR COMPENSATING DETECTOR NON-UNIFORMITIES

Stanley A. White, Santa Ana, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Apr. 19, 1983, Ser. No. 486,467
Int. Cl.⁴ G06F *15/36;* G01C *25/00*
U.S. Cl. 364—571 **17 Claims**



1. A system for compensating adjustment of an ensemble of N sampled input signals, the system comprising:
an address counter;
a plurality of signal processors, each coupled to receive a corresponding one of said N sampled input signals, wherein each of said signal processors comprises:
a first memory;
a second memory;
an incrementer for incrementing the value stored at a given location in said first memory in response to detection of a predetermined condition of said input signal;
a scaler for scaling the value stored at a given location in said first memory in response to an output from said address counter, combining the scaled value with the value stored in a corresponding location in said second memory, storing the most significant bits of the scaled value back in said first memory, and storing the least significant bits of the scaled value in said second memory; and
means for placing on an output line an accumulation of values stored at locations zero through a given location

in said first memory in response to an output from said address counter; and

a memory for applying to signals on said output lines of said plural signal processors a function.

4,573,134

TALKING CLOCK CALCULATOR

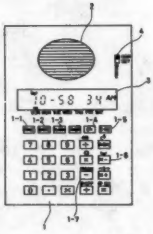
Yutaka Ikemoto, Nara, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Feb. 24, 1983, Ser. No. 469,392

Claims priority, application Japan, Feb. 24, 1982, 57-29554

Int. Cl.[4] G04B *21/08*; G01L *1/00*

U.S. Cl. 364—705 **1 Claim**



1. A timepiece comprising;

a timekeeping circuit means for keeping time-of-day and calendar information including month, day and year information;

output means connected to said timekeeping circuit means for outputting time-of-day information and calendar information provided thereto by said timekeeping circuit means;

said output means comprising voice synthesizer means for producing audible output of said time-of-day information and said calendar information provided thereto by said timekeeping circuit means and an audible output key for actuating said voice synthesizer means for providing said audible output;

mode selection means connected to said timekeeping circuit and said output means for selectively setting said timepiece in a first mode or a second mode; and

a DATE key for actuating said voice synthesizer means in said first mode for outputting said calendar information as audible indications of the month and date only and for actuating said voice synthesizer means in said second mode for outputting said calendar information as audible indications of the year, month, and date .

4,573,135

DIGITAL LOWPASS FILTER HAVING CONTROLLABLE GAIN

Charles B. Dieterich, Princeton, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Apr. 25, 1983, Ser. No. 488,594

Int. Cl.[4] G06F *7/38*

U.S. Cl. 364—724 **15 Claims**

1. A digital filter having a controlled gain for producing filtered digital signals from input digital signals comprising:

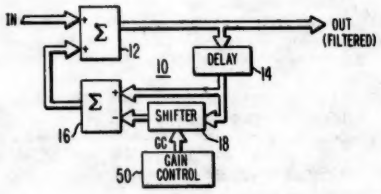
adding means having an output for producing the sum of digital signals applied to its first and second inputs, wherein said input digital signals are applied to said first input and said filtered digital signals are produced at said output;

delaying means, to which the output of said adding means is coupled, to delaying said digital sum signals;

multiplexing means for coupling a selected one of a plurality of inputs thereof to an output in accordance with a control signal, each of said plurality of inputs of said multiplexing means receiving said delayed digital sum signals modified by a respective gain factor;

means for coupling the output of said multiplexing means to the second input of said adding means for applying the one of said modified delayed digital signals selected by said multiplexing means; and

control means for developing said control signal, and for applying said control signal to said multiplexing means, to



select said one of said modified delayed digital signals thereby to control the gain of said digital filter, and wherein said control means comprises;

a source of a predetermined reference signal;

comparison means to which said predetermined reference signal and said filtered digital signals are applied for developing an indication of the relative levels thereof; and

means responsive to said indication for developing said control signal.

4,573,136

SUM-OF-PRODUCTS MULTIPLIER WITH MULTIPLE MEMORIES AND REDUCED TOTAL MEMORY SIZE

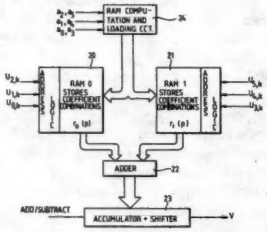
Timothy J. M. Rossiter, Sawbridgeworth, England, assignor to ITT Industries, Inc., New York, N.Y.

Filed Sep. 30, 1982, Ser. No. 429,953

Claims priority, application United Kingdom, Oct. 27, 1981, 8132315

Int. Cl.[4] G06F *7/52*

U.S. Cl. 364—728 **6 Claims**



1. A sum-of-products multiplier for deriving the sum of a number of independent multiplications, represented by digital data, comprising:

a plurality of separately addressable random access memory means for storing a plurality of precomputed digital data representations of weighting coefficients by which input binary numbers are to be multiplied;

addressing means for addressing and extracting said stored precomputed digital representations from said plurality of separately addressable random access memories in response to applied input bits;

adder means coupled to said memory means for selectively adding said extracted stored precomputed digital representations from said memories together;

accumulator means coupled to said adder means for accumulating outputs from said adder means, said accumulating

means including shifter means for shifting the content of said accumulator means such that the output thereof is the sum-of-products; and

updating means coupled to said memory means for updating the precomputed digital data in said memory means.

4,573,137

ADDER CIRCUIT

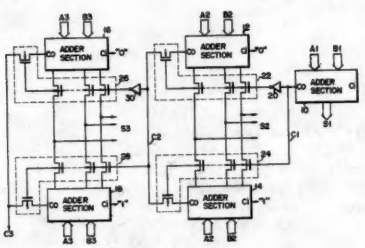
Masahide Ohhashi, Sagamihara, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Sep. 3, 1982, Ser. No. 414,833

Claims priority, application Japan, Nov. 27, 1981, 56-190122

Int. Cl.⁴ G05F *7/50*

U.S. Cl. 364—788 **5 Claims**



1. An adder circuit comprising:

first single adder means for receiving first and second input data from a least significant bit up to an Nth bit, wherein N is a predetermined integer, and a first predetermined carry input and for producing a sum of the received first and second input data and said first carry input;

second adder means for receiving third and fourth input data from an (N+1)th bit up to a most significant bit and a second carry input fixed to logic "0" and for producing at its output terminal a sum of the received third and fourth input data and said second carry;

third adder means for receiving said third and fourth input data and a third carry input fixed to logic "1" and for producing at its output terminal a sum of the received third and fourth input data and said third carry, said second and third adder means each including a plurality of adder means, the first and second input data from the (N+1)th bit up to the most significant bit being respectfully divided into a plurality of bit blocks each having N bits, and said second and third adder means each comprising at least one adder having the same construction as said first single adder means; and

selector means connected to said output terminals of said second and third adder means for selectively providing the sum and carry from the previous adder stage outputs of either one of said second and third adder means according to a fourth carry, said selector means including a plurality of identical gate circuits and being connected to said respectives adder means.

4,573,138

JUSTIFYING WITH PRINTER LEVEL DATA STREAM WHICH ACCOMMODATES FOOTERS AND HEADERS

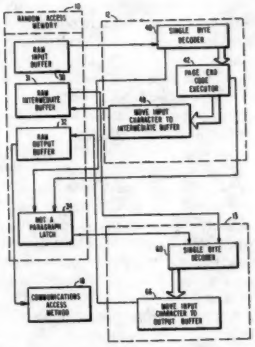
James L. Gaudet, Austin; Harry L. Lineman, Round Rock; Rudolph E. Chukran, Austin; Grover H. Neuman, Austin, and Johnny G. Barnes, Austin, all of Tex., assignors to International Business Machines Corp., Armonk, N.Y.

Filed Nov. 9, 1982, Ser. No. 440,235

Int. Cl.⁴ G06F *3/09*; B41J *5/30*

U.S. Cl. 364—900 **10 Claims**

1. A word processor system including means for converting a revisible data stream to a printable data stream comprising a sequential data stream of control data and character data, said printable data stream not being revisible, said means for converting comprising means for inserting into said printable data stream control data indicating the beginning and the end of a selected group of lines of printable characters to be justified whereby said selected group of lines may include a paragraph bridging two pages having a page footer on at least the first of the two pages, means for preventing justification of any line in said group which is at the end of a paragraph, and means for inserting into said printable data stream data representative of a page footer to be printed at the bottom of said at least the first of the two pages, said word processor system further including means for modifying said printable data stream to permit justification of the last body text line on a page containing a page


RANDOM ACCESS MEMORY
SINGLE BYTE DECODER
PAGE END CODE EXECUTOR
MOVE INPUT CHARACTER TO INTERMEDIATE BUFFER
SET A PARAGRAPH LATCH
COMMUNICATIONS ACCESS METHOD
MOVE INPUT CHARACTER TO OUTPUT BUFFER

footer when said last body text line is not a paragraph end, said means for modifying comprising:

means for temporarily storing the printable data stream from said means for converting,

means for determining from said printable data stream whether the last line on a page containing a footer is at the end of a paragraph, and

means connected to said means for temporarily storing and to said means for determining for modifying said printable data stream in said means for temporarily storing to permit justification of said last body text line when said last body text line is not a paragraph end.

4,573,139

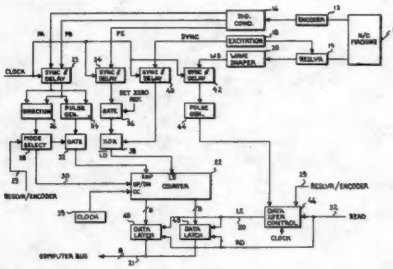
SYSTEM FOR POSITION SENSING TRANSDUCERS

Paul E. Bonivich, Waynesboro, Va., assignor to General Electric Company, Charlottesville, Va.

Filed Sep. 7, 1982, Ser. No. 415,744

Int. Cl.⁴ G06F *3/04*

U.S. Cl. 364—900 **12 Claims**



1. Apparatus for selectively interfacing signals to a computer from either a first or a second transducer disposed for monitor-

ing the relative position of an object, said second transducer being of the type arranged to provide a reference signal and a position signal whose phase relationship with said reference signal is indicative of position, and said first transducer being of the type providing A and B signals whose phase relationship is indicative of directional changes in position and whose number of transitions in amplitude occuring relative to a marker signal is indicative of position, comprising:

(a) a digital counter operable in a first mode as a reversing counter and operable in a second mode as a reference counter, said counter providing an output count which in each mode is indicative of the object's position;

(b) mode select means for causing said counter to operate in the first mode or the second mode depending on whether signals from said first transducer or said second transducer are to be interfaced to said computer;

(c) data latching means connected between said computer and said counter for receiving the output count from said counter and for holding the output count for a commanded transfer to said computer;

(d) means providing a clock signal for signal synchronization and for reference counting;

(e) means receiving said A and B signals from said first transducer and responsive thereto to generate a count signal indicative of said transitions of said A and B signals, said count signal being counted up or down by said counter depending on the phase relationship said A and B signals when said counter is in said first mode;

(f) means receiving the reference signal of said second transducer and responsive thereto to cause said counter to reset to a zero count upon each occurrence of said reference signal and then to allow said counter to begin counting said clock signal when said counter is in said second mode;

(g) means receiving the position signal of said second transducer and responsive thereto to generate a control signal causing said data latching means to hold the output count of said counter occuring substantially simultaneously with said position signal when said counter is in said second mode;

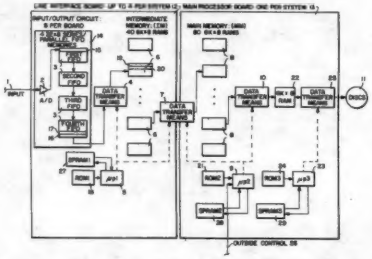
(h) data transfer control means responsive to a read command from said computer when said counter is in said second mode, for carrying out said commanded transfer of the position indicative count to said computer, and responsive to said read command from said computer when said counter is in said first mode, for latching and carrying out said commanded transfer of the position indicative count to said computer.

4,573,140

METHOD OF AND APPARATUS FOR VOICE COMMUNICATION STORAGE AND FORWARDING WITH SIMULTANEOUS ACCESS TO MULTIPLE USERS

Charles Szeto, Medway, Mass., assignor to Voicetek Corporation, Brighton, Mass.

Filed Mar. 30, 1983, Ser. No. 480,906
Int. Cl.[4] G06F *3/00, 13/00*
U.S. Cl. 364—900 **23 Claims**



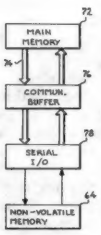
1. A method of recording digital data, that comprises providing successive segments of digital data, successively loading said segments into a first of a series of first-in-first-out (FIFO) memories and shifting the loaded data segments through the series of FIFO memories to a last FIFO memory of the series, and transferring data segments from the last FIFO memory to a further memory having sufficient capacity to store a plurality of said segments, the data transfer to the further memory being repeated frequently enough to ensure that the first FIFO memory is never full.

4,573,141

MEMORY INTERFACE FOR COMMUNICATING BETWEEN TWO STORAGE MEDIA HAVING INCOMPATIBLE DATA FORMATS

Francois Y. Simon, Raleigh, N.C., assignor to General Electric Company, Somersworth, N.H.

Filed Apr. 12, 1984, Ser. No. 599,683
Int. Cl.[4] G06F *3/00, 13/00*
U.S. Cl. 364—900 **3 Claims**



2. A method for communicating between a first memory capable of sending and receiving first data words having a first number of bits and a second memory capable of sending and receiving second data words having a second number of bits wherein neither of said first or said second numbers of bits is evenly divisible by the other thereof, comprising:

assembling a first predetermined number of said first data words into a first data block;

appending a leading word to said first data block;

serially transmitting said leading word and said first data block to said second memory;

said leading word including a pattern of bits which are at least partly ignored by said second memory and a remainder of said leading word, together with said first data block, forming said second data word whereby said second memory is effective to receive data from said first memory;

serially receiving a second predetermined number of said second words from said second memory;

forming said second predetermined number of said second words into a second data block;

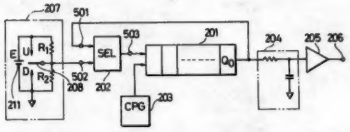
performing one of a shift and a selective transfer on said second predetermined number of said second words whereby said second words in said second data block are converted to a third data block, said third data block being a third predetermined number of said first data words; and

communicating said third data block to said first memory.

4,573,142
MEMORY CIRCUIT FOR PRODUCING ANALOG OUTPUT

Tadashi Azegami, Inagi, Japan, assignor to Kabushiki Kaisha Hokushin Denki Seisakusho, Tokyo, Japan

Filed Jul. 29, 1982, Ser. No. 403,195
Claims priority, application Japan, Aug. 10, 1981, 56-125074
Int. Cl.⁴ G11C *27/00*
U.S. Cl. 365—45 **20 Claims**



1. A memory circuit for producing an analog signal of a desired magnitude comprising:

memory means having a plurality of accessible memory locations each of which contains one-bit data indicating either H or L logic;

cyclic access means for cyclically and successively accessing all of said memory locations of said memory means into and out of which data is to be read;

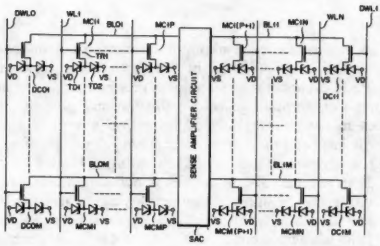
write means for producing levels of H and L logic to be written into the memory locations accessed by said cyclic access means so that the ratio between the numbers of H logic data and L logic data in all of said memory locations corresponds to the magnitude of an analog signal to be produced; and

a smoothing circuit coupled to said memory means for smoothing data read out of said memory means by operation of said cyclic access means to produce an output analog signal of the desired magnitude.

4,573,143
SEMICONDUCTOR MEMORY DEVICE HAVING TUNNEL DIODES

Naohiro Matsukawa, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Mar. 7, 1983, Ser. No. 472,605
Claims priority, application Japan, Mar. 8, 1982, 57-36019
Int. Cl.⁴ G11C *11/38*
U.S. Cl. 365—175 **7 Claims**



1. A semiconductor memory device comprising:

at least one memory cell having first and second power source terminals held at substantially constant potentials, first and second tunnel diodes connected in series in a forward-bias direction between the first and second power source terminals and a switching means connected at one end to a connection point between the first and second tunnel diodes;

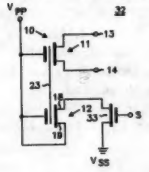
a bit line connected to the other end of said switching means; and

a word line connected to said switching means to supply a signal for controlling the conduction state of said switching means, the potential at the connection point between said first and second tunnel diodes being set at one of predetermined first and second potential levels during a write operation according to the potential on said bit line.

4,573,144
COMMON FLOATING GATE PROGRAMMABLE LINK

Roger S. Countryman, Jr., Austin, Tex., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Sep. 30, 1982, Ser. No. 431,935
Int. Cl.⁴ G11C *11/40*
U.S. Cl. 365—185 **4 Claims**



1. A programmable link, comprising:

a link transistor having source and drain regions formed in a face of a body of a semiconductor material with a channel region therebetween, a floating gate on said face having a first portion which overlies said channel region and is insulated therefrom, and a control gate overlying said first portion of the floating gate and insulated therefrom;

a programming transistor having source and drain regions formed in said face with a channel region therebetween, a second portion of said floating gate overlying the channel region and insulated therefrom, and a control gate overlying said second portion of the floating gate and insulated therefrom; and

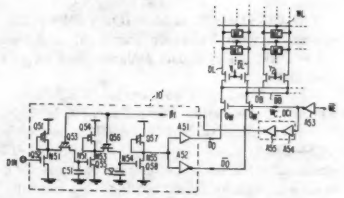
a select transistor having a drain coupled to the source region of the programming transistor, a source coupled to a first power supply terminal, and a gate for receiving a select signal; and

wherein the control gate of the link transistor and the control gate and the drain of the programming transistor are coupled to a second power supply terminal.

4,573,145
SIGNAL TRANSMITTING CIRCUIT

Takashi Ozawa, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Jun. 15, 1983, Ser. No. 504,562
Claims priority, application Japan, Jun. 15, 1982, 57-102618
Int. Cl.⁴ G11C *7/00*
U.S. Cl. 365—194 **7 Claims**



1. A transistor circuit comprising a data line, at least one memory cell coupled to said data line, means for receiving an input signal, a delay circuit having an input terminal coupled to

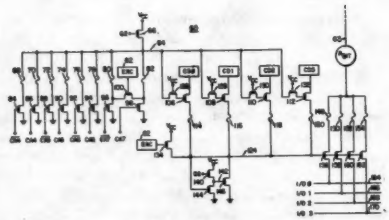
said receiving means, said delay circuit generating a delayed input signal at its output terminal after a controlled amount of delay time has elapsed from the receipt of said input signal, said delay circuit including a variable constant circuit, a time constant of said variable time constant circuit being changed between a first value and a second value in response to a first control signal, means for applying said input signal supplied at said input terminal of said delay circuit to said variable time constant circuit, means for coupling the output of said variable time constant circuit to said output terminal of said delay circuit, and means for transmitting said delayed input signal at said output terminal of said delay circuit to said data line.

4,573,146

TESTING AND EVALUATION OF A SEMICONDUCTOR MEMORY CONTAINING REDUNDANT MEMORY ELEMENTS

Andrew C. Graham, Dallas; Robert J. Proebsting, Plano, and Dennis L. Segers, Lewisville, all of Tex., assignors to Mostek Corporation, Carrollton, Tex.

Filed Apr. 20, 1982, Ser. No. 370,171
Int. Cl.[4] G11C *8/00, 11/40*
U.S. Cl. 365—200 **9 Claims**



2. A method for evaluating a semiconductor memory fabricated with redundant elements, the semiconductor memory having a memory array having a plurality of memory elements which are connectable to transfer data through an input/output line in response to an address signal wherein the memory array may have one or more implemented redundant memory elements therein leaving the rest, if any, of the redundant memory elements as non-implemented redundant memory elements, the method comprising the steps of:

receiving a selected functional mode command provided to said semiconductor memory;

connecting said implemented and non-implemented redundant memory elements to said input/output line in response to said command; and

transmitting a selected voltage state through said input/output line to said implemented and non-implemented redundant memory elements.

4,573,147

SEMICONDUCTOR MEMORY DEVICE

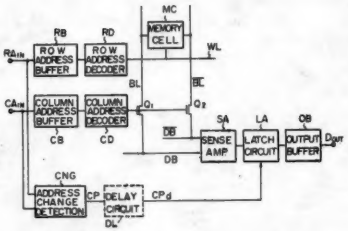
Keizo Aoyama, Yamato; Takahiko Yamauchi, and Teruo Seki, both of Kawasaki, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Mar. 25, 1983, Ser. No. 478,722
Claims priority, application Japan, Mar. 30, 1982, 57-50098
Int. Cl.[4] G11C *11/40*
U.S. Cl. 365—230 **12 Claims**

1. A semiconductor memory device, operatively connectable to receive input address signals having a plurality of bits, including a memory cell for storing and generating readout signals, said semiconductor memory device comprising:

an address-change detection circuit, operatively connected to receive the input address signals, for generating a pulse signal when one of the input address signals changes; and

a latch circuit, operatively connected to the memory cell and said address change circuit, for temporarily storing



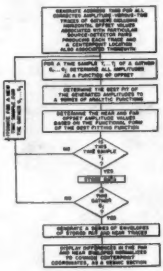
the readout signals from the memory cell in response to said pulse signal.

4,573,148

METHOD FOR THE INTERPRETATION OF ENVELOPE-RELATED SEISMIC RECORDS TO YIELD VALUABLE CHARACTERISTICS, SUCH AS GAS-BEARING POTENTIAL AND LITHOLOGY OF STRATA

Earl F. Herkenhoff, Orinda, and William J. Ostrander, Benicia, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Filed Feb. 1, 1982, Ser. No. 344,904
The portion of the term of this patent subsequent to Feb. 11, 2003, has been disclaimed.
Int. Cl.[4] G01J *1/28*
U.S. Cl. 367—47 **21 Claims**



1. A method for determining hydrocarbon-bearing potential and/or lithology of strata in the earth using high-intensity amplitude events in seismic records generated by conventional common centerpoint seismic collection and processing techniques in which presence of refraction energy within said records has been minimized, comprising the steps of:

(a) generating seismic data, including a record of signals from acoustic discontinuities associated with said strata of interest by positioning and employing an array of sources and detectors such that centerpoints between selected pairs of sources and detectors form a series of centerpoints along a line of survey, said recorded signals being the output of said detectors;

(b) by means of automated processing means, statically and dynamically correcting said recorded signals to form corrected traces whereby each of said corrected traces is associated with a centerpoint horizontally midway between a source-detector pair from which said each corrected trace was originally derived;

(c) by means of automated processing means, indexing said corrected traces so that each of said corrected traces is identified in its relationship to neighboring traces on the

basis of progressive changes in common centerpoint location;

(d) for a high-amplitude event, determining from among a series of analytic functions of known mathematical character, a best fit to amplitude vs. horizontal offset variations of a gather of said corrected traces, said gather of traces being identified with a common centerpoint location and a set of progressively changing horizontal offset values;

(e) predicting near and far amplitude vs. time trace projections for said gather of corrected traces for said event at new offset locations, by substituting one of said new near and far offset locations in said best fitting analytic function as the independent variable and solving said function for the dependent associated amplitude projection thereof, followed by substituting the other of said new near and far offset locations in said best fitting analytic function as the independent variable, and solving said function for the dependent associated amplitude projection thereof, said predicted near and far offset trace projections being identified with offset locations falling on opposite sides of said set of changing horizontal offset values;

(f) generating a first envelope of said trace amplitude projections of step (e) associated with near offset locations and a second amplitude envelope of said trace projections of step (e) associated with far offset locations and subtracting the two envelopes one from the other to form a difference envelope;

(g) displaying said difference envelope of step (f) so as to depict amplitude vs. time change as a function of centerpoint coordinate so that progressive change in said high-intensity amplitude event in said displayed traces is identified as a function of progressive change in centerpoint values.

4,573,149

MAGNETO-OPTICAL HEAD ASSEMBLY WITH IMPROVED DETECTION MEANS

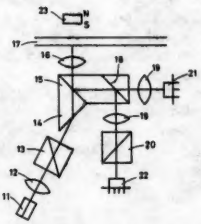
Toshihisa Deguchi, Nara; Kenji Ohta, Yao; Akira Takahashi, Nara, and Hideyoshi Yamaoka, Matsubara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Oct. 28, 1982, Ser. No. 437,504

Claims priority, application Japan, Oct. 29, 1981, 56-173975; Oct. 29, 1981, 56-173976; Jan. 18, 1982, 57-6645; Jan. 22, 1982, 57-9327

Int. Cl.⁴ G11B *11/00*

U.S. Cl. 369—13 **5 Claims**



1. A magneto-optical head assembly for a reflection-type magneto-optical memory apparatus comprising means for generating a laser beam for recording, retrieving, and erasing data on a recording medium comprised of a vertical, magnetic, and anisotropic thin film, means for guiding said laser beam emitted from said head assembly to a fixed position on said recording medium, a first light detection apparatus for receiving a control signal, and a second separate light detection apparatus for receiving a data signal, wherein the laser beam is reflected from the recording medium, said assembly comprising a beam splitter having means for increasing the magneto-optical rotation angle positioned in the light path of said reflected beam for dividing the reflected beam into a beam for control use and a beam for data use.

4,573,150

SELF-HOLDING SWITCH FOR USE IN A SOUND REPRODUCING DEVICE

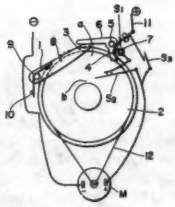
Eishi Koike, Sagamihara, Japan, assignor to Ozen Corporation, Tokyo, Japan

Filed Jul. 24, 1984, Ser. No. 633,866

Claims priority, application Japan, Jul. 29, 1983, 58-138981

Int. Cl.⁴ G11B *17/06*; A63H *3/33*

U.S. Cl. 369—67 **2 Claims**



1. A self-holding switch adapted for a sound reproducing device which has a power source, a motor driven by the power source, a record disc driven by the motor, a pickup engageable with the disc from a starting point for sound reproduction to a point at which sound reproduction ends, the pickup being returnable to the starting point by a return spring, the device being disposed in a casing, the self-holding switch comprising:

a rotatable lever having first and second arms, the lever biasingly urged in one rotational direction, the lever being releasably held in the opposite rotational direction by the pickup when it is at the starting point of sound reproduction;

a pin mounted to the casing, the lever pivotally mounted on the pin;

a movable contact mounted on the lever, the movable contact made of a length of resilient spring wire having a first end and a second end, the wire wound around the pin midway between the first and second ends, the first end of the wire connected to the casing, the second end of the wire connected to the first arm of the lever, the resilient wire urging the lever in said one rotational direction;

a first contact positioned proximate to the movable contact mounted on the lever such that the first arm of the lever matingly abuts the first contact bringing the second end of the resilient wire into releasable engagement with the fixed contact when the pickup engages the record disc;

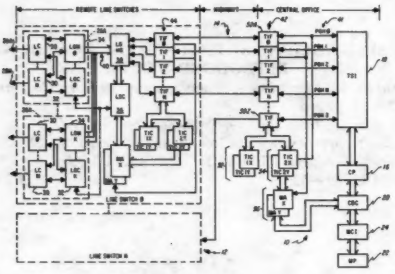
wherein the second arm of the lever extends toward and contacts the pickup when the pickup is at the starting point such that the distance between the pin and the point of contact between the pickup and the second arm is larger than the distance between the pin and the point of contact between the first arm and the fixed contact; and

wherein the first arm of the lever and the movable contact mounted thereon are moved out of engagement with the fixed contact, against the biasing force exerted by the movable contact by the pickup as the biasing force exerted on the pickup by the return spring returns the pickup to the starting position.

4,573,151
INTERFACE UNIT FOR TELEPHONE SYSTEM HAVING REMOTE UNITS

Haresh C. Jotwani, Longwood, Fla., assignor to Stromberg-Carlson Corp., Lake Mary, Fla.

Filed Jan. 20, 1984, Ser. No. 572,506
Int. Cl.[4] H04Q *11/00, 11/04*
U.S. Cl. 370—56 **14 Claims**



1. A telephony network comprising a plurality of subscriber lines each connected to one of a plurality of remote concentrator means which is in turn connected for transferring digital voice signals to a central office over a plurality of communications links in a first digital signal format, the central office including a plurality of highways for transferring highway timing signals and digital voice signals in a second digital signal format, and an interface unit for coupling the digital voice signals between the communications links and the highways, the interface unit comprising a plurality of interface modules and a control module for controlling all of the interface modules in tandem, in which:

A. each interface module is connected to one communications link and one highway and includes:

(i) communications link receiving means for receiving the digital voice signals in said first digital signal format from the communications link to which the interface module is connected, said receiving means including receiving timing means for generating communications link timing signals in response to the received digital voice signals for controlling the reception of the digital voice signals from said communications link;

(ii) transposing means connected to said communications link receiving means and the highway to which the interface module is connected for transposing the received digital voice signals from the first digital signal format to the second digital signal format in response to the communications link timing signals from the highway;

(iii) highway transmitting means connected to said transposing means for transmitting digital voice signals from said transposing means over the highway to which the interface module is connected;

(iv) highway receiving means connected to said control module and to the highway to which the interface module is connected for receiving highway timing signals and voice signals in the second digital signal format and for transmitting them to the control module; and

(v) communications link transmitting means connected to said control module and to the communications link to which the interface module is connected for receiving digital voice signals in the first digital signal format from said control module and for transmitting them over the communications link;

B. said control module including:

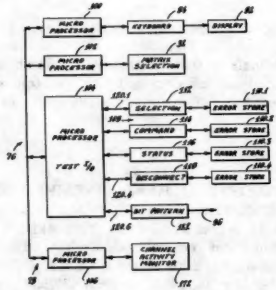
(i) control module receiving means connected to said highway receiving means of all of said interface modules and to one of said highways for receiving said digital voice signals in said second digital signal format from all of said interface modules and said highway timing signals from said one highway;

(ii) control module transposing means connected to said control module receiving means and all of said communications link transmitting means for transposing the digital voice signals from said second to said first digital signal format in response to the highway timing signals and for transmitting the transposed digital voice signals to respective ones of said communications link transmitting means for transmission over said communications link.

4,573,152
SWITCH MATRIX TEST AND CONTROL SYSTEM

Richard E. Greene, Sasqua Rd., Norwalk, Conn. 06855; Gladstone F. Young, 5 Winding Brook Ct., Redding, Conn. 06875; Gary E. Tom, 12 Aunt Patty's La., Bethel, Conn. 06801; Harry G. Schaffer, 5 Spicer Ct., Westport, all of 06880, and John S. Foote, RR #198, South Salem, N.Y. 10590

Filed May 13, 1983, Ser. No. 494,323
Int. Cl.[4] G06F *11/00;* **G01R** *31/28*
U.S. Cl. 371—22 **11 Claims**



1. A switch matrix system for selectively connecting a plurality of central processor units to peripheral devices comprising:

a switch matrix having channel ports and peripheral ports, one of said channel ports being designated as a diagnostic channel port, means for connecting a channel port to one or more peripheral ports, and means for controlling the connection of a channel port to a peripheral port;

means for causing the connection of a peripheral port to said diagnostic channel port; and

means for generating a sequence of signals representative of signals employed to establish data communication between a peripheral device and a central processor unit and applying said signals to the diagnostic channel port for transmission to a peripheral port connected to said diagnostic channel.

4,573,153
DATA TRANSMITTING-RECEIVING SYSTEM FOR SUPPRESSING DATA ERROR

Hiroshi Nakamura, Sagamihara; Eisuke Fukuda, Yokohama, and Susumu Sasaki, Fujisawa, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Nov. 30, 1983, Ser. No. 556,552
Claims priority, application Japan, Dec. 6, 1982, 57-212759
Int. Cl.[4] G06F *11/00*
U.S. Cl. 371—22 **10 Claims**

1. A data transmitting-receiving system having own-side and other-side channel routes operatively connected to receive and transmit digital input data, comprising:

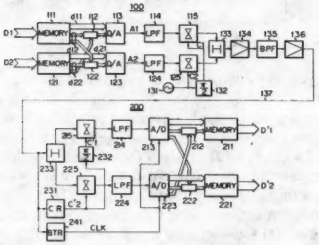
a transmitter unit, for converting the digital input data on the own-side and other-side channel routes into analog output signals, said transmitting unit comprising:

memory circuits, respectively, operatively connected to receive the digital input data as address signals, for outputting digital output data and digital correction output signals corresponding to the data on the own-side and the other-side channel routes;

carrier generator means for generating carrier signals;

digital-to-analog (D/A) converters, respectively, operatively connected to said memory circuits, for receiving and converting the digital output data from said memory circuits and the digital correction output signals corresponding to the own-side channel route and the other-side channel route, into analog output signals;

own-side and other-side modulators, operatively connected to said D/A converters and said carrier generator means, for receiving the analog output signals and the carrier signals and for modulating a first one of said carrier signals and a second one of said carrier signals, which is phase-shifted with respect to said first one of said carrier signals, with a respective one of the analog output signals and generating a modulated outputs signal; and



combining means, operatively connected to said own-side and other-side modulators, for combining the modulated output signals;

a transmission line, operatively connected to said combining means of said transmitter unit, for receiving the combined modulated output signals from said combining means; and

a receiver unit, operatively connected to said transmission line, for receiving the combined modulated output signals from said combining means of said transmitter unit and reproducing the data on the own-side channel route and other-side channel route.

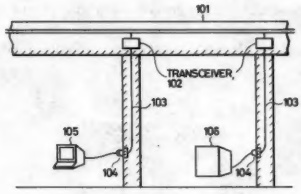
4,573,154

DATA COMMUNICATION SYSTEM WITH ERROR DETECTION/CORRECTION

Yukio Nakata, Kawasaki, and Osamu Shiotsu, Asaka, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 3, 1983, Ser. No. 538,510
Claims priority, application Japan, Oct. 8, 1982, 57-176299
Int. Cl.[4] H04L *1/14*
U.S. Cl. 371—34 **5 Claims**

1. A data communication system wherein data is communicated among a plurality of stations through first and second transmission lines connected to said stations, wherein each of the stations comprises first means for sending to said first transmission line an address of the station to which data is to be sent along with data in the form of a plurality of sequential signals, second means for receiving sequential data signals and an address sent through said first transmission line, third means for checking to see if an address received by said second means is one directed to the particular station, fourth means for immediately sending to said second transmission line the sequential data signals being received by said second means when an address directed to the particular station has been detected by said third means, and fifth means for comparing each of the sequential signals of the data received from said second transmission line and the sequential signals of the data sent by said first means on said first transmission line to determine the accuracy of transmission of data on said first transmission line.

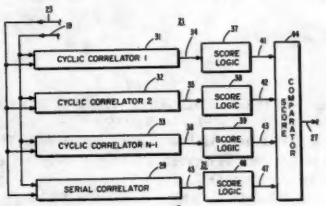


4,573,155

MAXIMUM LIKELIHOOD SEQUENCE DECODER FOR LINEAR CYCLIC CODES

Robert J. Currie, Salt Lake City; Billie M. Spencer, Bountiful; John W. Zscheile, Jr., Farmington, and Glen D. Rattlingourd, Salt Lake City, all of Utah, assignors to Sperry Corporation, New York, N.Y.

Filed Dec. 14, 1983, Ser. No. 561,502
Int. Cl.[4] G06F *11/10*
U.S. Cl. 371—37 **10 Claims**



1. A maximum likelihood sequence detector for decoding linear cyclic error correction codes, comprising:

means for receiving and demodulating an encoded data signal comprising linear cyclic error correction codewords having 2^k codewords in a code set,

means for quantizing said demodulated signals to provide a stream of quantized bits of information,

said quantized bits of information comprising said codewords having a length n,

a cyclic correlation decoder coupled to said stream of quantized bits comprising a plurality of cyclic correlators, and

said number of cyclic correlators in said cyclic correlation decoder being less than the number of codewords in a code set by a factor greater than 2.

4,573,156

SINGLE MODE LASER EMISSION

Philip J. Anthony, Bridgewater, and Eugene I. Gordon, Convent Station, both of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

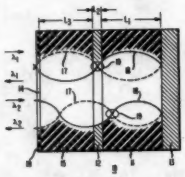
Filed Sep. 16, 1983, Ser. No. 532,777
Int. Cl.[4] H01S *3/098*
U.S. Cl. 372—19 **10 Claims**

1. An optical device for producing single longitudinal mode laser light emission comprising:

a semiconductor laser having an active area between first and second cleaved surfaces from which light is emitted and a spacing between cleaved surfaces such that multiple

longitudinal modes would normally be generated within the gain bandwidth of the laser; and

an optical filter which receives light from one of said surfaces and reflects light back to the laser, the filter comprising a reflecting layer spaced from said one of the cleaved surfaces, at least one thin, optically absorbing layer between said cleaved surface and reflecting layer, and at



least one dielectric layer between the absorbing layer and the reflecting layer,

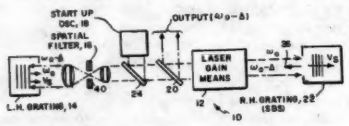
the thicknesses and indices of refraction of the absorbing and dielectric layers being such that the reflectivity characteristic of the filter has only one peak within the gain bandwidth of the laser and is capable of causing laser oscillation of only a single mode within that bandwidth when the reflected light is incident on the laser.

4,573,157

PHASE-CONJUGATE RESONATOR WITH A DOUBLE SBS MIRROR

Thomas R. O'Meara, Malibu, Calif., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Dec. 8, 1983, Ser. No. 559,613
Int. Cl.⁴ H01S *3/098*
U.S. Cl. 372—19 **9 Claims**



1. A laser, said laser comprising:

a stimulated Brillouin scattering mirror means for providing reflected radiant energy which is the phase conjugate of incident radiant energy on said SBS mirror means;

laser gain means for providing said incident radiant energy in response to excitation energy;

excitation means coupled to said laser gain means for exciting said laser gain means and inducing said laser gain means to output radiant energy;

coupling means for outputing said reflected radiant energy from said laser gain means;

a spatial filter for removing undesired lasing modes; and

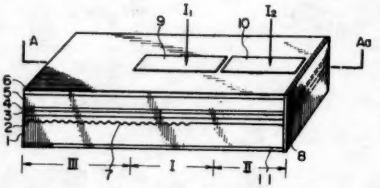
grating means for reflecting said reflected radiant energy, said grating means translating in unison with said SBS mirror means whereby a doppler shift in said reflected radiant energy incident on said grating means is substantially removed.

4,573,158

DISTRIBUTED FEEDBACK SEMICONDUCTOR LASER

Katsuyuki Utaka, Musashino; Kazuo Sakai, and Shigeyuki Akiba, both of Tokyo, all of Japan, assignors to Kokusai Denshin Denwa Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 410,431, Aug. 23, 1982, abandoned.
This application Feb. 8, 1985, Ser. No. 699,586
Claims priority, application Japan, Aug. 27, 1981, 56-133280
Int. Cl.⁴ H01S *3/19*
U.S. Cl. 372—32 **4 Claims**



1. A semiconductor laser of distributed feedback type, comprising:

a laser region (I) having periodic refractive index variations in the direction of light propagation in an active layer (3) and a layer (2,12) adjacent thereto and having an electrode for injection of a current for causing laser oscillation by injecting the current into the active layer,

a current injection region (II) defining at one side of the laser region (I) a waveguide layer (2) with no periodic refractive index variations provided along an extension of the periodic refractive index variations as a unitary extension of each of corresponding layers and of same compositions thereof for amplifying or modulating output light from the laser region (I) by current injection from another electrode, and

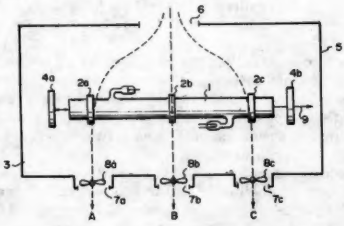
a non-exciting region (III) provided at the other side of the laser region (I) along another extension of the periodic refractive index variations as a unitary extension of each of corresponding layers but free of electrodes and of same compositions thereof for preventing light reflection from the other end facet of the semiconductor laser thereby to cause stable laser oscillation of single wavelength in the laser region (I).

4,573,159

TEMPERATURE-CONTROLLED LASER APPARATUS

Toshitaka Aagano, and Yoshimi Takasaki, both of Kaisei, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Jul. 12, 1984, Ser. No. 630,198
Claims priority, application Japan, Jul. 15, 1983, 58-128770
Int. Cl.⁴ H01S *3/04*
U.S. Cl. 372—34 **4 Claims**



1. A temperature-controlled laser apparatus provided with a

laser tube supported by a plurality of mounts on a supporting plate, a case housing said laser tube, a plurality of temperature sensors positioned on said mounts, on said supporting plate near said mounts or on said laser tube for detecting the temperatures of said mounts or said supporting plate near said mounts or said laser tube, and a plurality of ventilation means positioned on said case, wherein the improvement comprises positioning said ventilation means to generate air streams passing over respective sections the temperatures of which are detected by said temperature sensors or near said respective sections, and operating said ventilation means in accordance with outputs of said temperature sensors, thereby maintaining the temperatures at said respective sections at a predetermined level.

4,573,160
EXCITATION CIRCUIT FOR A TE HIGH-ENERGY LASER SYSTEM

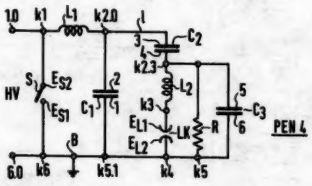
Hans-Jürgen Cirkel; Willi Bette, and Reinhard Müller, all of Erlangen, Fed. Rep. of Germany, assignors to Kraftwerk Union Aktiengesellschaft, Mulheim an der Ruhr, Fed. Rep. of Germany

Filed Jun. 29, 1984, Ser. No. 626,456

Claims priority, application Fed. Rep. of Germany, Jun. 30, 1983, 3323614

Int. Cl.⁴ H01S *3/00*

U.S. Cl. 372—38 **20 Claims**



1. Excitation circuit for a TE high-energy laser system, operating with excitation by an arc free, maximally homogeneous capacitor discharge in a gasfilled space of a laser chamber between at least two mutually spaced-apart laser electrodes disposed opposite one another, the laser electrodes extending parallel to the optical axis of the laser chamber, the TE high-energy laser further including at least one high-speed, high-voltage switch, activatable for energizing a pulse-generating network to generate high-voltage pulses at the laser electrodes; the pulse generating network having first and second stripline capacitors associated with the high-voltage switch and the laser chamber and with appertaining equivalent inductances of the excitation circuit formed from self-inductance of the high-voltage switch, the laser chamber, leads of the system and the stripline capacitors, comprising at least a third stripline capacitor included in the pulse-generating network in addition to the first and second stripline capacitors, a series connection of the high-voltage switch and one of the equivalent inductances being connected in parallel with the first stripline capacitor and with a series-parallel circuit formed of the second stripline capacitor and a parallel connection made up of said third stripline capacitor in parallel with an impedance as well as with a series connection of the laser chamber and another of the equivalent inductances, whereby said third stripline capacitor may be considered as having been added to a Blümlein pulse-generating network, in parallel with a series connection of the discharge gap of the laser chamber and an equivalent inductance or may be considered as having been created by adding of a Blümlein type first stripline capacitor to a charge transfer-type pulse-generating circuit, in parallel with a series connection of the high-voltage switch and an equivalent inductance and thereby changing the charge transfer type second stripline capacitor into a ICT-type third stripline capacitor and changing the charge transfer type first stripline capacitor into said Blümlein type second stripline capacitor.

4,573,161
SEMICONDUCTOR LASER

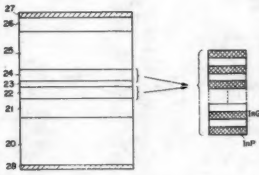
Kazuo Sakai, Tokyo; Yuichi Matsushima, Tokorozawa; Shigeyuki Akiba, Tokyo, and Katsuyuki Utaka, Musashino, all of Japan, assignors to Kokusai Denshin Denwa Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 30, 1983, Ser. No. 556,294

Claims priority, application Japan, Jul. 12, 1982, 57-213303

Int. Cl.⁴ H01S *3/19*

U.S. Cl. 372—45 **2 Claims**



1. In a semiconductor laser in which first and second semiconductor layers of different conductivity types are formed as clad layers on both sides of a light emitting region in contact therewith, the improvement comprising the first and second semiconductor layers each formed by alternately laminating pluralities of two or more kinds of semiconductor thin film layers of different refractive indexes and having a thickness less than 0.03 μm and the thickness of the thin film layer of at least one kind of the semiconductor thin film layers of a thickness less than 0.03 μm varies in dependence upon their remoteness from the light emitting region.

4,573,162
GAS LASER, PARTICULARLY FAST AXIAL FLOW GAS TRANSPORT LASER

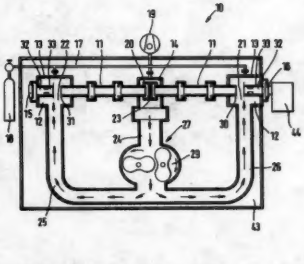
Lothar Bakowsky, Hofheim; Eckhard Beyer, Ober-Ramstadt; Gerd Herziger, Robdorf, and Peter Loosen, Mainz, all of Fed. Rep. of Germany, assignors to Messer Griesheim GmbH, Frankfurt am Main, Fed. Rep. of Germany

Filed May 29, 1984, Ser. No. 614,512

Claims priority, application Fed. Rep. of Germany, Jul. 2, 1983, 3323954

Int. Cl.⁴ H01S *3/03*

U.S. Cl. 372—61 **27 Claims**



1. In a fast axial flow gas transport laser having a discharge tube through which laser gas flow, the improvement being said discharge tube having at least one sudden irregular enlargement of the cross section of said discharge tube, stops being mounted in said enlargement of the cross section of said discharge tube, and said discharge tube being connected to one end head having a tangential laser gas intake opening and to one end head having a laser gas outlet opening; enlargement of

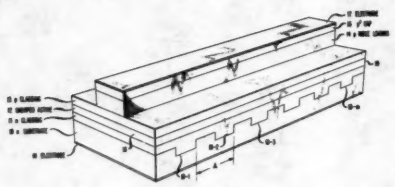
the cross section of said discharge tube being at specific points in said discharge tube as determined by the wavelength of the macro-vortex which forms in said discharge tube as a result of a rotation impulse generated by tangential laser gas inflow.

4,573,163

LONGITUDINAL MODE STABILIZED LASER

Ivan P. Kaminow, Holmdel, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Sep. 13, 1982, Ser. No. 417,568
Int. Cl.[4] H01S *3/19*
U.S. Cl. 372—96 **6 Claims**



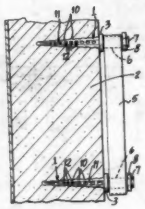
1. A semiconductor laser comprising:
an active medium;
a first cladding layer of p-type semiconductor material;
a second cladding layer of n-type medium semiconductor material, said active medium being between said first and second layers;
first and second electrical contacts to said first and second layers, respectively;
and a feedback mechanism including periodic perturbations in the transmission characteristic of said laser;
characterized in that:
the spatial period, Λ, of said perturbations is equal to at least ten times half the wavelength of the optical wave guided by said laser, said perturbations comprising refractive index changes of said laser.

4,573,164

SUPPORT FOR ELECTRICAL RESISTANCES OF OVENS OR KILNS WITH CERAMIC MANTLE THERMAL INSULATION

Ozias A. Gnutzmans, Sao Paulo, Brazil, assignor to Combustol Industria e Comercio Ltda., Sao Paulo, Brazil

Filed Feb. 15, 1985, Ser. No. 702,263
Claims priority, application Brazil, Feb. 16, 1984, 6400230[U]
Int. Cl.[4] H05B *3/66*
U.S. Cl. 373—130 **1 Claim**



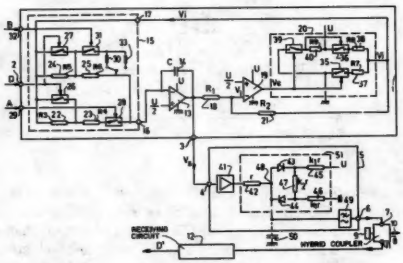
1. Support for electrical resistances of ovens or kilns with ceramic mantle thermal insulation, used to support electrical resistances of the kind consisting of a filament or ribbon of electrical conductor material laid in a sinuous or fretwork fashion on supports characterized by a mounting end **1** essentially in the shape of an isosceles triangle, which is buried into the thermal insulation layer **2** of an oven or kiln of the kind consisting of a mantle, paper, cloth or similar material of refractory ceramic fibers, followed by a middle flange **3** which is placed next to the surface of the said thermal insulating layer **2**, facing the interior of the oven or kiln chamber, and from which there extends a cylindrical end **4** on which rests the filament or ribbon of electrical conductor material constituting the resistance **5**, which end **4** is provided near its free end with a surrounding annular groove followed by a rectangular prismatic head **7** equal in width to the diameter of the said grooved portion and equal in length to the diameter of the end **4**, there being provided to complete the assembly a removable ring **8** with a rectangular opening **9** of a size sufficient to pass over the head **7** and which upon being passed over the head **7** is turned approximately 90° so that it is installed on the grooved portion **6**, one side holding the resistance **5** on the end **4** and the other side having the area adjacent to the opening **9** against the head **7**, and by the fact that the mounting end **1** is provided with sinuous edges **10** and centrally and longitudinally on either face with a pronounced rib **11** provided with a series of continuous indentations **12** which give it too a sinuous profile.

4,573,165

TRANSMISSION CIRCUIT FOR MODEMS EMPLOYING FREQUENCY SHIFT KEYING

Robert Boudault, Limours, France, assignor to 501 Telecommunications Radioelectriques et Telephoniques T.R.T., Paris, France

Filed Jun. 24, 1983, Ser. No. 507,823
Claims priority, application France, Jun. 25, 1982, 82 11203
Int. Cl.[4] H03C *3/02;* H03K *7/06*
U.S. Cl. 375—9 **5 Claims**



1. An improved transmission circuit for a modem which also includes a receiving circuit, such transmission circuit comprising a modulator and a filter circuit and being adapted to transmit binary data signals over a transmission path by frequency shift modulation of a pair of carrier waves, the frequencies of such carrier waves being selectable between a pair of specified low frequencies and a pair of specified high frequencies, such improvement being characterized in that:
said modulator comprises an integrating circuit, a bistable trigger circuit and a resistor network, the output of the trigger circuit being connected to the input of the integrating circuit through the resistor network so as to form a regenerative feedback loop which causes the integrating circuit to produce a triangular carrier wave at a frequency determined by the resistance of the resistor network;
said resistor network comprises first and second resistive branches connected in parallel between the output of the trigger circuit and the input of the integrating circuit, each of said branches comprising first and second resistors connected in series; first and second analog switches respectively shunting the first resistor in each of said branches, said first and second switches both being controlled by the binary data signal to be transmitted to simultaneously short-circuit the first resistor in each of said branches in response to one value of such signal; and a third analog switch in series with the second resistor in the second of said branches, said third switch being controlled

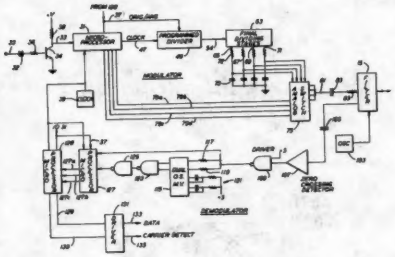
by a binary control signal applied thereto; whereby the resistance of said resistor network may be set to any of four distinct values determined by the logical combinations of said binary data signal and said binary control signal, thereby causing said integrating circuit to selectably produce carrier waves at said pair of specified low frequencies or at said pair of specified high frequencies;

and said filter circuit is connected to the output of said integrating circuit to receive the triangular carrier wave produced thereby, said filter circuit being adapted to modify the waveform of such triangular wave so as to suppress odd harmonics thereof which are within the frequency band of the modem receiving circuit.

4,573,166
DIGITAL MODEM WITH PLURAL MICROPROCESSORS

Carlton Frederick, Ithaca, N.Y., assignor to Wolfdata, Inc., Chelmsford, Mass.

Filed Jun. 24, 1983, Ser. No. 507,578
Int. Cl.[3] H04L *27/18*; H03C *3/00*; H03D *3/00*
U.S. Cl. 375—9 **17 Claims**



3. A demodulator for a digital modem comprising:

a. means for generating a pulse at each zero crossing of an incoming modulated waveform to be demodulated;

b. means for indicating whether each zero crossing occurs with the waveform going positive or negative;

c. a first microprocessor having as inputs said pulses and the output of said means for indicating, said microprocessor programmed to simultaneously use said information to maintain synchronization with said incoming modulated waveform and to determine, from said information, dibits corresponding to the demodulated incoming waveform being received and to provide said dibits as outputs, at a rate equal to about one half an established data rate; and

d. a second microprocessor receiving as inputs said dibit information from said first microprocessor and programmed to convert said dibit information into a serial bit stream at the desired data rate.

4,573,167
DIGITAL COMMUNICATION SYSTEM, PARTICULARLY COLOR TELEVISION TRANSMISSION SYSTEM

Siegbert Hentschke, Tamm, and Klaus Schaper, Stuttgart, both of Fed. Rep. of Germany, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Sep. 28, 1983, Ser. No. 536,601
Claims priority, application Fed. Rep. of Germany, Oct. 9, 1982, 3237578
Int. Cl.[4] H03M *7/38*
U.S. Cl. 375—27 **3 Claims**

1. A digital communication system of the type in which the bit rate of digital signals is reduced for transmission in a transmission path extending between a transmitter and a receiver from an initial bit rate to a reduced transmission bit rate, comprising

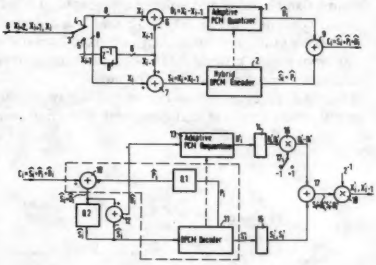
an encoder arranged at the transmitter and operative for converting a sequence of digital input words having the initial bit rate into a line code consisting of consecutive digital line code words having the reduced transmission bit rate, said encoder including

means for adding every two consecutive ones of the input words to one another to obtain a sum thereof,

means for subtracting every two consecutive ones of the input words from one another to obtain a difference thereof,

means for converting said difference into a difference code word, including adaptive PCM quantizing means having a variable quantizing characteristic,

means for converting said sum into a sum code word, including hybrid DPCM encoding means which includes means for controlling said quantizing characteristic of said adaptive PCM quantizing means as a function of a prediction error present therein, and



means for combining said sum and difference code words into the respective line code word; and

a decoder arranged at the receiver and operative for converting the line code received from the transmission line into a sequence of digital output words having said initial bit rate, said decoder including

means for separating said difference and sum code words from said respective received line code word,

means for decoding said respective difference code word, including adaptive PCM requantizing means having a variable quantizing characteristic,

means for decoding the respective sum code word, including DPCM decoding means which includes means for controlling said quantizing characteristic of said adaptive PCM requantizing means as a function of a prediction error present therein, and

means for recovering the original consecutive input words from said decoded sum and difference code words, including means for performing successive subtraction and addition of said decoded sum and difference code words and subsequent division of the results by two.

4,573,168
BALANCED BIDIRECTIONAL OR PARTY LINE TRANSCEIVER ACCOMMODATING COMMON-MODE OFFSET VOLTAGE

Christopher P. Henze, Eagan, and David F. Grimm, Apple Valley, both of Minn., assignors to Sperry Corporation, New York, N.Y.

Filed Aug. 31, 1984, Ser. No. 646,269
Int. Cl.[4] H04B *1/56, 3/50*
U.S. Cl. 375—36 **7 Claims**

1. A biased transceiver apparatus having improved immunity to common-mode voltage which appears to said trans-

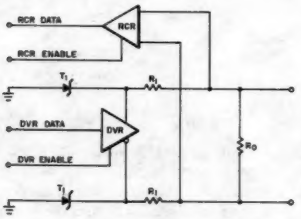
ceiver as a d.c. voltage bias impressed upon a differential data signal, said improved biased transceiver apparatus comprising:

a differential current driver means for sourcing current to a high output port and for sinking current to a low output port;

first zener diode means anode connected to ground and cathode connected to said high output port of said differential current driver means for IF said ground is at more positive voltage than said high output port THEN conducting current from said ground to said high output port ELSE IF said high output port is at a positive voltage less than a fixed breakdown voltage above said ground THEN not conducting current ELSE IF said high output port is at a positive voltage greater than said fixed breakdown voltage above said ground THEN conducting current from said high output port to said ground;

second zener diode means anode connected to ground and cathode connected to said low output port of said differential current driver means for IF said ground is at more positive voltage than said low output port THEN conducting current from said ground to said low output port ELSE IF said low output port is at a positive voltage less than a fixed breakdown voltage above said ground THEN not conducting current ELSE IF said low output port is at a positive voltage greater than said fixed breakdown voltage above said ground THEN conducting current from said low output port to said ground;

a differential receiver means connected between a first communications line one and a second communications line



one of a pair of differential signal communications lines for receiving signals appearing as a differential voltage between said first communications line and said second communications line;

cable impedance matching resistance means connected between said first communications line and said second communications line at the point of said differential receiver means for providing a first resistance between said first communications line and said second communications line wherein said first resistance does substantially match the real component of the impedance of said pair of differential signal communications lines;

first resistor means between said high output port of said differential current driver means and said first communications line one of said pair of differential signal communications lines for providing a second resistance between said high output port of said differential current driver means and said first communications line wherein said second resistance is sufficient that current limiting is provided of current sourced from said high output port of said differential current driver means to said first communications line while simultaneously the ratio of said second resistance to said first resistance does allow that a said differential voltage adequate for said receiving by said differential receiver means will appear across said cable impedance matching resistor means;

second resistor means between said low output port of said differential current driver means and said second communications line one of said pair of differential signal communications lines for providing a second resistance between said low output port of said differential current driver means and said second communications line wherein said second resistance is sufficient that current limiting is provided of current sinked from said first communications line driver means to said low output port of said differential current while simultaneously the ratio of said second resistance to said first resistance does allow that a said differential voltage adequate for said receiving by said differential receiver means will appear across said cable impedance matching resistor means.

4,573,169

COMMUNICATION SYSTEM FOR BI-PHASE TRANSMISSION OF DATA AND HAVING SINUSOIDAL LOW PASS FREQUENCY RESPONSE

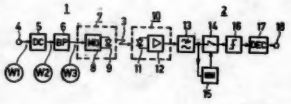
Petrus J. van Gerwen, and Wilfred A. M. Snijders, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

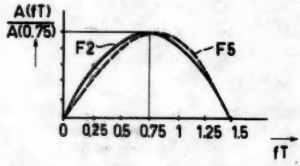
Filed Dec. 12, 1983, Ser. No. 560,767

Claims priority, application Netherlands, Dec. 16, 1982, 8204856

Int. Cl.⁴ H04B *1/66*; H03C *3/00*; H03D *3/00*

U.S. Cl. 375—55 **4 Claims**





1. A communication system for transmitting binary data symbols in synchronous, consecutive symbol period intervals having a duration of T seconds, comprising: a data transmitter for converting each data symbol into a transmitted bi-phase modulated signal whose waveform in an interval T is given by one cycle of a carrier having a frequency 1/T Hz and whose phase is shifted in accordance with the modulating data symbol; a data receiver for receiving the transmitted bi-phase modulated signal and deriving the data symbols therefrom; and circuit means for filtering the bi-phase modulated signal in accordance with a frequency response which approximates zero at 0 Hz, approximates zero for frequencies at and exceeding 3/(2T) Hz, and has an approximately sinusoidal variation between the said frequencies 0 Hz and 3/(2T) Hz.

4,573,170

APPARATUS AND METHOD FOR SAMPLING MULTIPLE CARRIER SIGNALS

Waymon A. Melvin, Jr., St. Mathews Township, Wake County, and Theodore H. York, Raleigh, both of N.C., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Feb. 15, 1984, Ser. No. 580,504

Int. Cl.⁴ H04B *7/10*; H04L *1/02*

U.S. Cl. 375—100 **9 Claims**

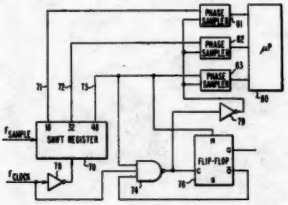
1. Apparatus for sampling a plurality of carrier signals, comprising:

first means for providing a sample pulse, said sample pulse having a first frequency;

second means for providing a clock pulse, said clock pulse having a second frequency;

first means for causing a first output signal a first predetermined time period after an occurrence of said sample pulse, said first predetermined time period being generally equal to a first integral number of occurrences of said clock pulses;

second means for causing a second output signal a second predetermined time period after an occurrence of said sample pulse, said second predetermined time period being generally equal to a second integral number of occurrences of said clock pulse;



first means for measuring the instantaneous logic level of a first carrier signal, said first measuring means being cooperatively associated with said first causing means, said first measuring means being responsive to said first output signal;

second means for measuring the instantaneous logic level of a second carrier signal, said second measuring means being cooperatively associated with said second causing means, said second measuring means being responsive to said second output signal; and

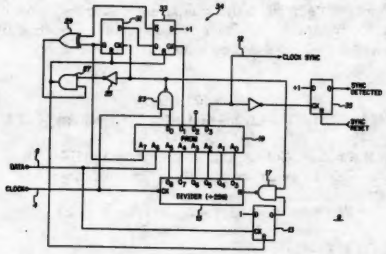
said second frequency being higher than said first frequency, said second frequency being an integer multiple of said first frequency, and means for synchronizing each pulse of said first frequency with a pulse of said second frequency.

4,573,171

SYNC DETECT CIRCUIT

Michael F. McMahon, Jr., Cedar Rapids, and James M. Lavenz, Hiawatha, both of Iowa, assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Dec. 27, 1982, Ser. No. 453,655
Int. Cl.⁴ H04L *7/08*
U.S. Cl. 375—114 **7 Claims**



1. A synchronization detection system for detecting a synchronization code in a stream of digital data comprising:

means for receiving a stream of digital data including a coded synchronization portion having first and second code segments;

means responsive to the receipt of said digital data stream for generating a selected synchronization verification code having first and second segments representing a predetermined synchronization code, said means for generating a selected synchronization verification code including,

means responsive to said digital data stream for providing a first enable signal,

means for generating a plurality of addresses, said means for generating a plurality of addresses being responsive to a selected first enable signal and second enable signal,

means responsive to said generated addresses for providing said synchronization verification code,

means responsive to correspondence between a first segment of a coded synchronization portion in said digital data stream and a first segment of said synchronization verification code for providing said second enable signal, and

means responsive to said second enable signal for initiating said comparison of the second segment of said coded synchonization portion and said second segment of said synchonization verification code; and

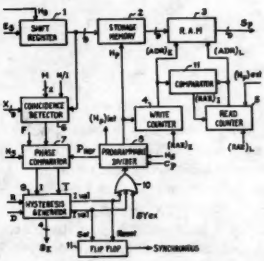
means responsive to said digital data stream having a coded synchronization portion having first and second segments which are identical to said first and second segments of said synchronization verification code for generating a synchronization signal.

4,573,172

PROGRAMMABLE CIRCUIT FOR SERIES-PARALLEL TRANSFORMATION OF A DIGITAL SIGNAL

Jean-Luc Grimaldi, Rennes, France, assignor to Thomson CSF, Paris, France

Filed Jun. 22, 1984, Ser. No. 623,560
Claims priority, application France, Jun. 30, 1983, 83 10910
Int. Cl.⁴ H04L *7/04*
U.S. Cl. 375—116 **6 Claims**



1. a circuit for the series-parallel transformation of a series digital signal having sequences of synchronization words determining a frame thereof into a sequence of parallel binary words comprising: an input shift register controlled by a series clock said shift register being connected to a storage register controlled by a parallel clock, a coincidence detector circuit having a first input which receives a reference synchronization word, a second input receiving the series digital signal from an output of said shift register and an output delivering coincidence pulses when the reference word is detected in the series digital signal, a phase comparator receiving, on a first input thereof the coincidence pulses and, on a second input thereof, a phase reference signal, at a timing rate of the parallel words, a divider whose divisor is programmable to a value related to the number of parallel word bits, controlled by said series clock for supplying said phase reference signal, said phase comparator delivering pulses I or $\bar{I}$ at two outputs thereof depending on whether the coincidence pulses are in phase or out of phase with the phase reference signal, and a logic hysteresis circuit connected to the outputs of said phase comparator and having two outputs upon which are supplied respective validated pulses Ival or $\bar{I}$val when a predetermined number of successive pulses I or $\bar{I}$ respectively, are detected, the validated

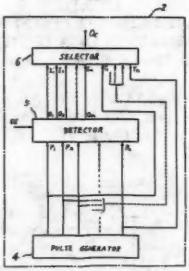
pulses being applied to a sync control input of the programmable divider.

4,573,173

CLOCK SYNCHRONIZATION DEVICE IN DATA TRANSMISSION SYSTEM

Tadahiro Yoshida, Kawasaki, Japan, assignor to Nitsuko Limited, Kawasaki, Japan

Filed Jun. 6, 1984, Ser. No. 618,410
Claims priority, application Japan, Jun. 6, 1983, 58-100628
Int. Cl.[4] H04L *7/00*
U.S. Cl. 375—118 **6 Claims**



1. A circuit for obtaining a first clock pulse synchronized to a data signal received at a receiving side in a data transmission system, the data signal being sent out from a transmitting side under control of a second clock pulse having a constant repetition frequency, which comprises;

first means for generating a predetermined number (n) of pulse signals having a repetition frequency equal to said second clock pulse, said n pulse signals being equiangularly spaced from one another in pulse phase;

second means having n pulse input terminals for receiving said n pulse signals from said first means, respectively, a data input port for receiving said data signal, and n output terminals corresponding to said n pulse input terminals respectively, said second means selecting one of said n output terminals corresponding to one of said n pulse input terminals to which a pulse is inputted at first after said second means receives a first data bit signal from said data input port, and sending out a selection signal to said selected one of said n output terminals continuously; and

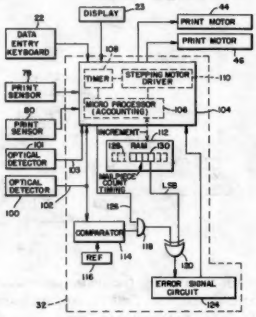
third means having n terminals receiving said n pulse signals from said first means, respectively, n input terminals coupled with said n output terminals of said second means and corresponding to said n receiving terminals, respectively, and a clock output terminal, said third means selecting one of said n pulse signals on one of said n receiving terminals corresponding to one of said n input terminals on which said selection signal is inputted from said second means and outputs the selected pulse signal from said clock output terminal, whereby said first clock pulse synchronized to the received data signal is obtained from said clock output terminal.

4,573,174

ELECTRONIC POSTAGE METER HAVING INTERLOCK BETWEEN MECHANICAL AND ELECTRICAL REGISTERS

Raymond R. Crowley, Newtown; Alton B. Eckert, Norwalk, and John H. Soderberg, Stratford, all of Conn., assignors to Pitney Bowes Inc., Stamford, Conn.

Filed Sep. 7, 1982, Ser. No. 415,514
Int. Cl.[4] G06M *3/12*; H03K *21/40*
U.S. Cl. 377—39 **6 Claims**



1. A tamper resistent postage meter for imprinting postage on mailpieces comprising:

(a) print drum means for imprinting postage on the mailpieces;

(b) drive means for operating said drum means, said drive means including a mechanical counter of rotation of said drum means;

(c) electronic circuitry coupled to said drive means for designating amounts of postage to be imprinted by said drum means;

(d) means coupled to said electronic circuitry for detecting the number of rotations of the drum means, said electronic circuitry including an electronic counter of the number of mailpieces receiving postage;

(e) means coupled to said mechanical counter and said electrical counter for comparing the least significant bit of the count of the mechanical counter with the least signficant bit of the count of the electronic counter for the detection of possible tampering from any discrepancies between the two counts; and

(f) means coupled to the comparing means for signaling the electronic circuitry to terminate further operation of said meter until serviced by a qualified serviceman.

4,573,175

VARIABLE DIGITAL FREQUENCY GENERATOR WITH VALUE STORAGE

John R. Cressey, College Pk., and Stephen A. Miller, Baltimore, both of Md., assignors to Case Communications Inc., Silver Spring, Md.

Filed Sep. 12, 1983, Ser. No. 531,328
Int. Cl.[4] H03B *3/72*
U.S. Cl. 377—44 **14 Claims**

1. A controllable digital variable frequency generator having an input signal at a first frequency and deriving therefrom an output signal at an adjustable output frequency comprising:

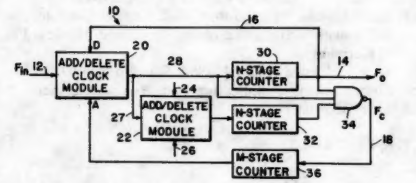
feedback means for utilizing a portion of said input signal to modify the input signal to provide the desired output frequency and to maintain the output frequency thus obtained; and

change means responsive to change signals for modifying the input signal comprising connecting means for periodi-

cally deleting a pulse from said input signal responsive to said first change signal;

said feedback means comprising first means, including first N-stage ripple counter means for providing to said change means a first change signal representing a number of changes in a modified form of said input signal, thereby providing a first modification of said input signal; and

comprising second means including presettable counter



means receiving said modified form of said input signal and having an output for providing a second change signal to said change means for adding a pulse to said input signal, said change means operable for adding a pulse to said input signal responsive to said second signal;

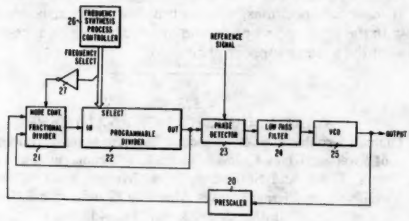
said presettable counter means receiving signals representative of a preset count for adjusting the number of second change signals provided thereby for adding a pulse to said input signal.

4,573,176

FRACTIONAL FREQUENCY DIVIDER

Richard O. Yeager, Camden, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Nov. 18, 1983, Ser. No. 553,246
Int. Cl.⁴ H03K *23/48*
U.S. Cl. 377—48 **14 Claims**



1. An apparatus responsive to an input clock signal of frequency f for generating periodic pulses of frequency f/(2N+1), where N is an integer, said apparatus comprising:

first divider means having an input terminal and an output terminal for providing at said output terminal a signal comprising periodic pulses at a frequency rate which is the Nth division of the frequency of a signal applied at said input terminal;

second divider means for generating an output signal of frequency f/(2+1/N), said second divider means including a divide-by-two circuit and an inhibiting circuit,

said divide-by-two circuit having first and second input terminals and an output terminal, said divide-by-two circuit being responsive at said first input terminal thereof to particular transitions of said input clock signal for generating signal transitions at said divide by two circuit output terminal

said inhibiting circuit being responsive to particular transitions of said signal comprising periodic pulses for generating inhibiting signal pulses,

said divide-by-two circuit being responsive at said second input terminal thereof to said inhibiting signal, such that each of said inhibiting signal pulses prevents one of said particular transitions of said input clock signal from generating a signal transition at said output terminal of said divide-by-two circuit; and

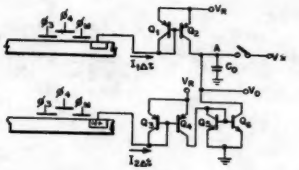
means for coupling said second divider means output signal to said first divider means input terminal.

4,573,177

BI-DIRECTIONAL CURRENT DIFFERENCER FOR COMPLEMENTARY CHARGE COUPLED DEVICE (CCD) OUTPUTS

Kenneth J. Petrosky, Glen Burnie, Md., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Feb. 6, 1984, Ser. No. 577,392
Int. Cl.⁴ H03K *23/46, 3/86*
U.S. Cl. 377—60 **13 Claims**



1. A bi-directional current differencer for subtracting complementary charge coupled device (CCD) outputs of a first charge coupled device which produces a first output current from a second output current produced by a second charge coupled device, said bi-directional current differencer comprising:

first and second current mirrors, each being forward biased and each respectively biasing a discrete output of said first and second charge coupled devices to positive and acting to mirror the first and second charge couple device output currents by collector current matching while under a forward bias, said first current mirror thereby producing a first mirrored output current, said second current mirror thereby producing a second mirrored output current;

a circuit polarity reversing means, said reversing means producing an output by converting the outputs of said first current mirror into a current sink, and

a subtracting means, said subtracting means combining the current sink output with the positive-biased output of said second current mirror.

4,573,178

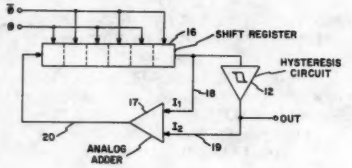
COUNTER EMPLOYING FEEDBACK SHIFT REGISTER CONTROLLING HYSTERESIS CIRCUIT

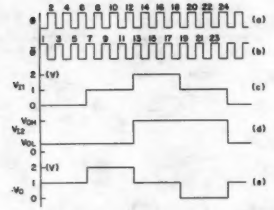
Hiroshi Morito, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 378,851, May 17, 1982. This application Jul. 18, 1985, Ser. No. 756,566
Claims priority, application Japan, May 18, 1981, 56-74403
Int. Cl.⁴ H03K *25/12*
U.S. Cl. 377—97 **8 Claims**

1. A counter comprising timing signal generator circuit means for generating first to fifth timing signals at predetermined time intervals, hysteresis circuit means having an input-output characteristic which presents a hysteresis characteristic defined by a low input threshold level and a high input threshold level, control signal generating circuit means coupled to said timing signal generator circuit means for sequentially generating a first control signal having a voltage level which is lower than said low input threshold level in response to said first timing signal, a second control signal having a voltage level which is between said low input threshold level and said

high input threshold level in response to said second timing signal subsequent to said first timing signal, a third control signal having a voltage level which is higher than said high input threshold level in response to said third timing signal subsequent to said second timing signal, and thereafter sequentially generating the second control signal in response to said fourth timing signal subsequent to said third timing signal, and





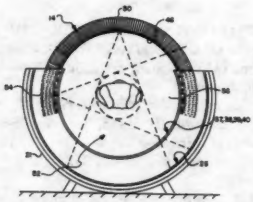
sequentially generating the first control signal in response to said fifth timing signal subsequent to said fourth timing signal, means for applying the output of said control signal generator input means to said hysteresis circuit means, and output means for repeatedly taking an output signal in response to said second to said third control signal transitions and to said second to said first control signal transitions respectively.

4,573,179

SCANNED PROJECTION RADIOGRAPHY USING HIGH SPEED COMPUTED TOMOGRAPHIC SCANNING SYSTEM

Brian K. Rutt, San Francisco, Calif., assignor to Imatron, Inc., South San Francisco, Calif.

Filed May 29, 1984, Ser. No. 615,063
Int. Cl.[4] G01M *23/00*
U.S. Cl. 378—10 **5 Claims**



1. In a high speed CT scanning system in which fan beams of radiation are generated by sweeping an electron beam along a target and collimated X-rays emitted by the target are received by an array of detectors after passing through a patient area between said target and said array of detectors, a method of obtaining a two dimensional radiograph of a patient comprising the steps of

sweeping repeatedly said electron beam along said target,

measuring radiation received at one detector position as said electron beam is swept along said target,

moving said patient past said collimated X-rays, and

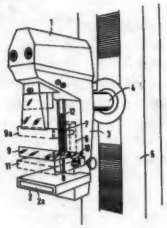
assemblying said two dimensional radiograph from said radiation measured at said one detector position.

4,573,180

X-RAY DIAGNOSTIC APPARATUS WITH A COMPRESSION CARRIAGE

Herbert Summ, Wilhelmsdorf, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Aug. 24, 1984, Ser. No. 644,079
Claims priority, application Fed. Rep. of Germany, Nov. 8, 1983, 8332063[U]
Int. Cl.[4] A01B *6/00*
U.S. Cl. 378—037 **1 Claim**



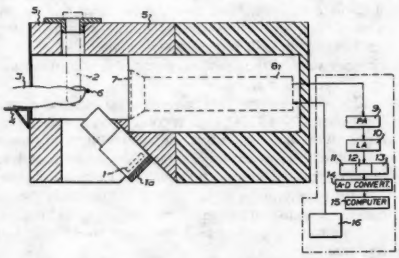
1. An X-ray diagnostic apparatus of the type having a source of X-rays having a focus, a vertically movable motor-driven compression carriage which supports a compression plate and a first support plate for an object to be X-rayed, comprising: a second support plate which is closer to the focus than the first support plate and means for mounting the compression plate in at least two positions, of which a first position is associated with the first support plate, and of which a second is associated with the second support plate.

4,573,181

X-RAY FLUORESCENCE ANALYZERS

Thomas Grönberg, Södra Sandby; Torsten Almen, Malmö, both of Sweden; Klaes Golman, Rungsted, Denmark; Sören Mattsson, Lund, and Staffan Sjöberg, Malmö, both of Sweden, assignors to Elementanalys Almen & Gronberg AB, Sweden

Filed Jan. 5, 1983, Ser. No. 455,842
Claims priority, application Sweden, Jan. 12, 1982, 8200121
Int. Cl.[4] G01N *23/22*
U.S. Cl. 378—45 **2 Claims**



1. An apparatus for determining the iodine content in a sample volume, characterized by a radiation source (1) that is ^{241}Am and that excites the iodine in the sample volume with

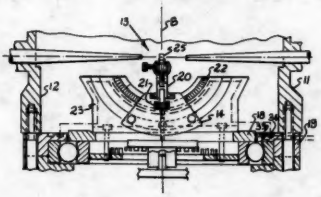
collimated radiation such that the iodine emits its characteristic X-ray radiation, an NaI(Tl) scintillation detector (7, 8) which is directed towards the sample volume for reception of X-ray radiation therefrom at an angle of approximately 135° in relation to the collimated excitation radiation directed towards the sample volume such that both the energy of Compton-scattered photons received from the sample volume and the difference between this energy and 28.5 keV differ substantially from the energy of the characteristic X-ray radiation of iodine, three single-channel analyzers (11, 12, 13) of which a first (12) register the number of pulses of the detector within a predetermined energy interval about the energy value for the characteristic X-ray radiation of iodine, and the other two (11, 13) register the number of pulses at the limits of said interval, and a calculating unit (15) for determining, from the two latter pulse numbers, the background radiation in said interval and for determining the iodine content from the difference between the pulse number of the first analyzer (12) and the pulse number representing the background radiation.

4,573,182

X-RAY DIFFRACTION CAMERA

Vincent J. Manners, 29 Mepunga St., Concord West, New South Wales, Australia (2138)

Filed Mar. 28, 1984, Ser. No. 595,998
Claims priority, application Australia, Mar. 29, 1983, PF8662
Int. Cl.⁴ G01N *23/205, 23/207*
U.S. Cl. 378—075 **8 Claims**



1. An X-ray diffraction camera having a sample support to position the sample at a predetermined location, means to receive and support a film, means to direct X-rays at the sample so that scattered rays leaving said sample expose said film, and drive means to cause motion of said sample support so that movement of said sample approximates random motion, said drive means being adapted to rotate said sample support about at least one axis and to move said sample linearly intermittently during rotation of said sample.

4,573,183

X-RAY IMAGE BRIGHTNESS CONTROL

Gary F. Relihan, Nashotah, Wis., assignor to General Electric Company, Schenectady, N.Y.

Filed Jun. 29, 1984, Ser. No. 625,918
Int. Cl.⁴ H04N *1/38, 5/32, 7/18*
U.S. Cl. 378—108 **4 Claims**

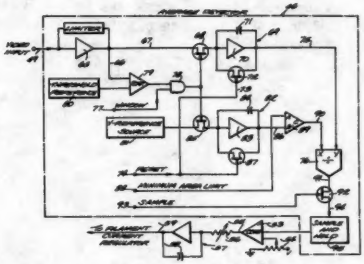
1. A method of regulating the brightness level of an optical image that corresponds to an X-ray image, produced with the beam of an X-ray tube, said method comprising the steps of:

generating analog video signals representative of said optical image and using said signals to drive a raster scanned video monitor to display said image,

integrating the video signals for each horizontal video line only during the times that the video signals are greater in magnitude than a threshold reference signal and there is coexistence with window signals that define the integration length along each horizontal scan line,

concurrently with integrating said video signals, integrating a voltage signal whose integrated value is a function of time, and since the scan rate is constant over each video field said value corresponds to the area over which said video signal is integrated,

dividing the integrated signal value representative of average image brightness by the integrated signal value corresponding to area such that the resulting signal is representative of brightness per unit area,



comparing said resulting signal with a reference signal representative of the image brightness desired, and

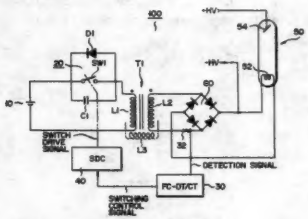
using the error signal resulting from the comparison to control an X-ray tube current regulator to adjust the tube current and thereby change the image brightness by an amount that reduces the error signal to zero.

4,573,184

HEATING CIRCUIT FOR A FILAMENT OF AN X-RAY TUBE

Shigeru Tanaka, Ootawara, and Toshihiro Onodera, Kuaitachi, both of Japan, assignors to Kabushiki Kaisha Toshiba, Japan

Filed Sep. 26, 1984, Ser. No. 655,073
Claims priority, application Japan, Sep. 27, 1983, 58-179804
Int. Cl.⁴ H05G *1/34*
U.S. Cl. 378—110 **13 Claims**



1. A heating circuit for a filament of an X-ray tube comprising:

transformer means having at least a primary winding coupled to a DC source and a secondary winding coupled to the filament of the X-ray tube;

switching means, connected between the primary winding of the transformer means and the DC source, having at least a capacitor and a diode functioning as a damper diode, connected parallel to the capacitor and the switching means, the switching means constituting a voltage resonance type switch in conjunction with at least the capacitor and the primary winding, whereby a DC voltage of the DC source is interrupted and thus an AC voltage having an arc waveform is induced at the secondary winding;

detection means, coupled to the filament of the X-ray tube, for detecting a filament current to produce a switching control signal; and

means for driving the switching means by controlling at least

one of a switching period and a conducting period thereof while retaining a resonant condition of the voltage resonance type switch so as to vary the filament current.

4,573,185

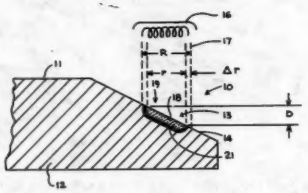
X-RAY TUBE WITH LOW OFF-FOCAL SPOT RADIATION

Brian D. Loumsberry, Hales Corners, and Robert W. Meade, Brookfield, both of Wis., assignors to General Electric Company, Milwaukee, Wis.

Filed Jun. 27, 1984, Ser. No. 625,277

Int. Cl.[4] H01J *35/10*

U.S. Cl. 378—125 **15 Claims**



11. An improved X-ray tube of the type of having a rotating anode substrate with an associated annual focal track for receiving a beam of electrons from the cathode to produce X-rays, the improvement comprising a focal track with a radial dimension which is slightly less than the radial dimension of the electron beam.

4,573,186

FINE FOCUS X-RAY TUBE AND METHOD OF FORMING A MICROFOCUS OF THE ELECTRON EMISSION OF AN X-RAY TUBE HOT CATHODE

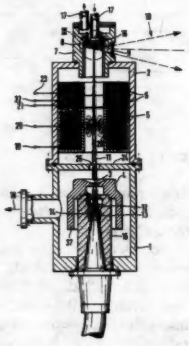
Alfred Reinhold, Wunstorf, Fed. Rep. of Germany, assignor to Feinfocus Rontgensysteme GmbH, Wunstorf, Fed. Rep. of Germany

Filed Jun. 16, 1983, Ser. No. 505,056

Claims priority, application Fed. Rep. of Germany, Jun. 16, 1982, 3222511

Int. Cl.[4] H01J *35/06, 35/14*

U.S. Cl. 378—138 **7 Claims**



1. A fine-focus X-ray tube comprising an evacuated cylinder housing a heated cathode for emitting an electron beam, a grid surrounding said cathode, an anode comprising a partition having an aperture through which said electron beam passes, means for condensing and focusing said electron beam and a target on which said beam is projected to produce X-rays, said cathode comprising a bent filament the dimensions of which are large in relation to its electron emitting surface area, and said grid being in the form of a thick-walled hollow metal cylinder surrounding said cathode and having an outer face facing said target, the outermost part of said cathode comprising said electron emitting surface area being approximately at the level of said outer face of the grid, the small electron emitting surface area of said cathode being heated to a temperature substantially higher than that of the remaining surface of said cathode by passing electric current through said filament to heat said filament while the surface areas of said cathode other than said small electron emitting surface area are cooled by heat absorbing properties of surrounding portions of said grid which are nearer to said other surface areas of said cathode than to said small electron emitting surface area.

4,573,187

SPEECH-CONTROLLED ELECTRONIC APPARATUS

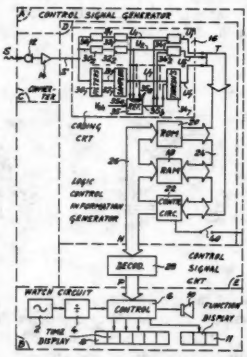
Ngoc C. Bui; Jean-Georges Michel, both of Neuchatel, and Jean-Jacques Monbaron, Malvilliers, all of Switzerland, assignors to Asulab S.A., Bienne, Switzerland

Filed May 17, 1982, Ser. No. 379,265

Claims priority, application Switzerland, Jul. 24, 1981, 4827/81

Int. Cl.[4] G10L *1/00*

U.S. Cl. 381—43 **8 Claims**



1. A speech-controlled apparatus for performing a plurality of functions comprising:

electro-acoustic means for converting a word pronounced by the user of the apparatus, said word belonging to a predetermined vocabulary, into an analog signal;

means for coding said signal including:

a plurality of band-pass filter means for filtering said analog signal, each of said band-pass filter means having a distinct band-pass to provide a plurality of filtered analog signals,

means for sampling each of said filtered analog signals,

means for setting a threshold value, and

means for comparing each sample of each filtered signal to said threshold and for allocating to each sample a first digital value if said sample has an amplitude which is greater than said threshold, and a second digital value in the opposite case, thereby forming from each analog filtered signal, strings of digital values, said strings forming together said coded digital signal;

said apparatus further comprising:

first processing means for sequentially detecting in each of said strings an isolated sample having said second digital value surrounded by two samples having said first digital value and for allocating to said isolated sample said first digital value, and means for then sequentially detecting in each of said strings an isolated sample having said first digital value and for allocating said second digital value to

said isolated sample, whereby simplified strings of digital signals are formed, said simplified strings of digital signals forming together a coded digital signal representative of said pronounced word;

means for memorizing as refernces in coded form all of the words of said predetermined vocabulary, each reference corresponding to an instruction for performing at least certain functions of the apparatus;

means comparing said coded digital signal to at least a part of said references;

means for selecting the compared reference which is closest to said coded digital signal;

means for informing the user on the selected reference in response to said selected reference;

means for transforming said selected reference into a control signal; and

actuating means responsive to said control signal for performing said functions.

4,573,188

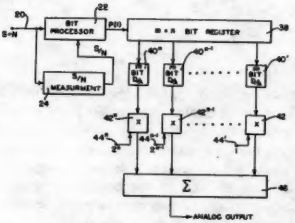
DIGITAL TO ANALOG CONVERTER

Sidney W. Lewinter, Redondo Beach, Calif., assignor to The Aerospace Corporation, Los Angeles, Calif.

Continuation of Ser. No. 386,836, Jun. 10, 1982, Pat. No. 4,499,594. This application Dec. 24, 1984, Ser. No. 685,756

Int. Cl.⁴ G10L *1/00*

U.S. Cl. 381—46 **1 Claim**



1. In a method of converting a multibit digital data word into a corresponding analog signal, the method including the steps of multiplying weighting factors for each bit position with a value associated with each bit in a series of analog multipliers, and wherein the outputs of said analog multipliers are summed together to form the resultant analog signal, the improvement comprising:

generating a probability value for each bit corresponding to the probability that the bit is a logical one as a function of measurements of voltage characteristics of each bit and noise associated with the word to be converted; and

using said probability values as scaling factors to modify the outputs of said analog multipliers to thereby reduce potential for error.

4,573,189

LOUDSPEAKER WITH HIGH FREQUENCY MOTIONAL FEEDBACK

David S. Hall, Palo Alto, Calif., assignor to Velodyne Acoustics, Inc., Santa Clara, Calif.

Filed Oct. 19, 1983, Ser. No. 543,375

Int. Cl.⁴ H04R *3/00*

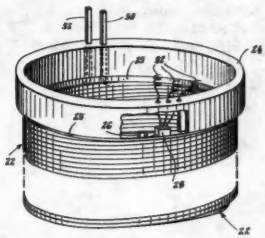
U.S. Cl. 381—96 **35 Claims**

1. In a loudspeaker of the moving-coil type, the combination of:

a motional transducer element rigidly secured to the moving coil of said loudspeaker;

negative feedback means coupled to said transducer to direct the transducer signal to a summing point together with a loudspeaker audio signal to form a closed feedback loop;

an amplifier having its input coupled to said summing point and its output driving said moving coil;



said feedback loop providing an open loop gain in excess of unity and a phase angle less than 180° at a frequency in excess of about 1000 Hz.

4,573,190

METHOD AND SYSTEM OF PROCESSING IMAGE SIGNALS

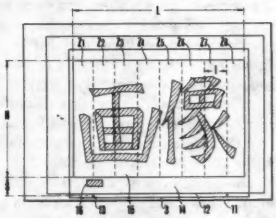
Teruo Tsumoda, Chiba, and Ryoichi Kokawa, Nara, both of Japan, assignors to Komori Printing Machinery Co., Ltd., Japan

Filed Dec. 8, 1982, Ser. No. 448,443

Claims priority, application Japan, May 19, 1982, 57-84546

Int. Cl.⁴ G06K *9/50*

U.S. Cl. 382—1 **2 Claims**



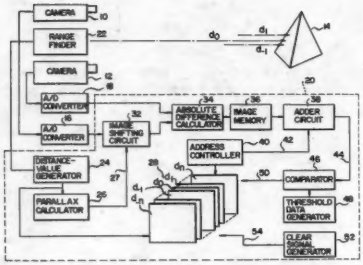
1. In an image area measuring apparatus of the type wherein an image bearing surface of a lithographic printing plate is divided into a plurality of zones and photographed with a television camera to produce an analog image signal which is converted into a digital signal to obtain a measured value, the image area of each zone is calculated based on the measured value and a quantity of printing ink supplied at the time of printing to said lithographic printing plate is determined according to said image area, a method of processing an image signal comprising the steps of preparing a first conversion table for zones having at least a portion with 100% dot ratio and a second conversion table for other percentage of dot ratios, determining the quantity of printing ink from said first conversion table at the time of printing an image having a 100% dot ratio portion, and determining the quantity of the printing ink from said second conversion table at the time of printing an image having a dot ratio other than 100%.

4,573,191

STEREOSCOPIC VISION SYSTEM

Masatsugu Kidode, Yokohama, and Yoshinori Kuno, Kawasaki, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Mar. 29, 1984, Ser. No. 594,733
Claims priority, application Japan, Mar. 31, 1983, 58-56071
Int. Cl.[4] G06K 9/52
U.S. Cl. 382—1 8 Claims



1. A stereoscopic vision apparatus for extracting, from the entire image of a three-dimensional scene, at least one partial image with respect to a predetermined reference distance, and recognizing, on the basis of two-dimensional image processing, whether or not an object actually exists apart from said apparatus by the reference distance in a certain direction, thereby automatically performing a scene analysis, said apparatus comprising:

(a) image input means for simultaneously sensing an incoming image light of a three-dimensional objective body from different points of view and for producing first image signals representing a plurality of two-dimensional body images for the same objective body;

(b) first operating means for receiving distance value data designating the reference distance and for calculating the parallax for the reference distance of said plurality of body images to produce parallax value data;

(c) parallax compensating circuit means, connected to said image input means and said first operating means, for compensating at least one of the first image signals so as to effect a geometric transformation of said body images in accordance with said parallax value data, and for generating second image signals representing a geometrically compensated body image corresponding to said reference distance; and

(d) distance image generating means, connected to said parallax compensating circuit means, for generating a distance image of the three-dimensional objective body corresponding to said reference distance, each pixel of the distance image indicating information about the three-dimensional objective body portion which is apart from said image input means by substantially said reference distance, and said distance image generating means including,

second operating means, connected to said parallax compensating circuit means, for calculating correlation values, from at least said second image signals, among mutually corresponding image portions of the body images, and for producing a sequence of said correlation values as third image signals; and

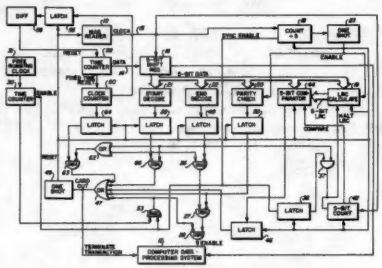
third operating means, connected to said second operating means, for extracting, from said third image signals, signals which satisfy a predetermined condition about said correlation values, thereby obtaining said distance image of said three-dimensional objective body.

4,573,192

END OF TRANSACTION CONTROL SYSTEM

Richard W. Roth, Scottsdale; William T. Gregor, Phoenix; Michael D. Sherwood, Tempe, and Ned Pokrajac, Phoenix, all of Ariz., assignors to Engineered Systems Inc., Tempe, Ariz.

Filed Jan. 16, 1984, Ser. No. 570,965
Int. Cl.[4] G06K 9/00
U.S. Cl. 382—1 12 Claims



1. For use wth a document reading system in which each document has data characters separated by a start character and an end character, a document presence indication and transaction termination system including in combination:

means for reading a document inserted therein and producing signals on an output thereof representative of the sequence of characters encoded on such documents;

identifying mean coupled to the output of said reading means for identifying at least said start and end characters and producing signals representative thereof;

utilization means coupled with the output of said reading means for utilizing data signals supplied thereto corresponding to the data characters on said documents; and

means coupled with said identifying means and coupled with at least said utilization means for initializing and maintaining a transaction operation in response to identification of a start character before an end character in the sequence of characters read by said reading means and for terminating a transaction operation initiated by a document in said reading means in response to identification of an end character before a start character by said identifying means.

4,573,193

INDIVIDUAL IDENTIFICATION APPARATUS

Yukichi Shuto, Abiko, and Tamotsu Miyagawa, Inazawa, both of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 3, 1984, Ser. No. 627,605
Claims priority, application Japan, Jul. 25, 1983, 58-135612
Int. Cl.[4] G06K 9/00
U.S. Cl. 382—2 10 Claims

1. An individual identification apparatus, which comprises:

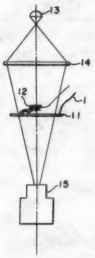
(a) a transparent measuring table, on which four fingers of a hand of an individual person to be an object of identification are placed in juxtaposition;

(b) a guide member mounted on said measuring table to restrict the position of the hand on it and establish finger lengths;

(c) a light source for irradiating light onto said measuring table;

(d) a two-dimensional photo-electric conversion device to receive light irradiated from said light source and passed through said measuring table, and to generate electrical signals of an intensity to be determined by an intensity of the light at every light receiving point on the two-dimensional plane;

(e) means for outputting electrical signals generated at every light receiving point of said two-dimensional photoelectric conversion device as the video electrical signals by scanning said two-dimensional plane at a predetermined scanning speed;



(f) a comparator for quantizing intensity of the video electrical signal from said output means into a level of intensity of the transmitting light at the portion where the hand and the guide member are not placed on said measuring table and a level of intensity of the transmitting light at the portion where both are placed; and

(g) an information processing unit for receiving said quantized intensity of the video electric signal from said comparator for establishing a base line perpendicular to said guide member on said hand, and for determining therefrom the distance between said base line and the tips of said four fingers and the three differences between the distances of adjacent fingers and for identifying an individual person as the object of the identification on the basis of said three differences.

4,573,194

Patent Not Issued For This Number

4,573,195

SYSTEM FOR THE AUTOMATIC OBSERVATION AND QUANTIFICATION OF PHENOMENA CAPABLE OF BEING DETECTED BY FLUORESCENCE

Henri G. de France, 6, rue du Dr. Brouardel, 75016 Paris, France

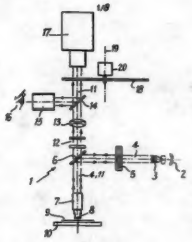
Filed Aug. 31, 1983, Ser. No. 528,007

Claims priority, application France, Sep. 3, 1982, 82 15054

Int. Cl.[4] G06K *9/00;* H04N *5/52*

U.S. Cl. 382—6 **13 Claims**

1. A system for the automatic observation and quantification of phenomena capable of being detected by fluorescence and appearing in a localized zone (8), said system comprising a source of radiation (2), optionally associated with an excitation filter (5), for sending onto said localized zone (8) excitation radiation capable of producing said fluorescence, optical observation means (7) for said localized zone (8), and at least one filter (12) for blocking the excitation radiation and arranged in the path of the luminous fluorescence radiation emanating from said localized zone (8), characterized in that it comprises disc means (18) provided with at least one peripheral indentation (21) and two different colored filters (22, 23) selected in accordance with the wavelength of the luminous fluorescence radiation for examining said localized zone (8), a variable gain picture-taking tube means (17) for successively examining said localized zone (8) through said optical observation means (7) and through said at least two different colored filers (22, 23),



memory means 38_R, 38_Y) for storing the electric signals corresponding to the individual colored images seen by said picture-taking tube means (17), means for simultaneously recovering said electric signals at the output of said memory means, and means for separately adjusting the level of the background for each colored image under the control (by 44) of the amplification gain of said tube means; wherein the signals emanating from said picture-taking tube have a dome-shaped background, and said system is further characterized in that it comprises generator means (45), under the control of the gain of said picture-taking tube means (17) and producing inverted dome-shaped signals (AD), for cancelling the dome-shaped background of the signals emanating from said picture-taking tube means and caused by the fact that the brightness of a luminous area is generally higher at the center of the area than on the boundaries of said area.

4,573,196

CONFUSION GROUPING OF STROKES IN PATTERN RECOGNITION METHOD AND SYSTEM

Hewitt D. Crane, Portola Valley, and John S. Ostrem, Palo Alto, both of Calif., assignors to Communications Intelligence Corporation, Menlo Park, Calif.

Filed Jan. 19, 1983, Ser. No. 459,180

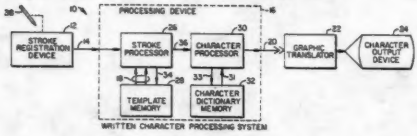
Int. Cl.[4] G06K *9/62*

U.S. Cl. 382—13 **17 Claims**

1. A method for identifying patterns by means of a pattern registration means and a data processing means, wherein each pattern comprises at least one unknown stroke generated by relative movement between a pattern-forming means and a pattern-accommodating means of said pattern registration

means, said pattern registration means being operative to generate first signal information represented by first signals, said first signal information being representative of stroke information about said unknown stroke, said data processing means being provided with prestored second signal information represented by second signals, said second signal information including templates corresponding to template strokes, said data processing means being operative to generate third signals representing third signal information in response to said first signals and said second signals, said third signal information comprising identity labels for use in developing coded information which identifies said patterns, said method comprising:

defining templates from said second signal information wherein at least one of said templates is a confusion group



template, each said confusion group template being derived from information about at least two of said template strokes;

generating distance metric values representative of closeness of stroke shape between said first signal information and said second signal information for at least each one of said confusion group templates; and

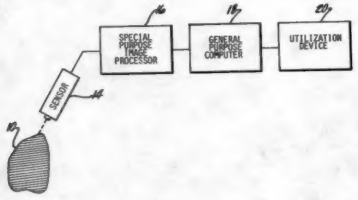
determining from said distance metric values which of said confusion group templates or which of said stroke templates yields the least of said distance metric values to obtain an identity label for said unknown stroke by ignoring decision criteria for distinguishing between selected template strokes whenever said selected template strokes are included in a common one of said confusion group templates.

4,573,197

METHOD FOR AUTOMATIC RECOGNITION OF TWO-DIMENSIONAL SHAPES

Thomas R. Crimmins, 555 E. William, Apt. 20-A, Ann Arbor, Mich. 48104

Filed Dec. 13, 1983, Ser. No. 561,156
Int. Cl.[4] G06K 9/78
U.S. Cl. 382—22 **6 Claims**



1. A method of automatically recognizing objects comprising:

a. scanning said objects with a scanning means such as a video camera to produce signals representing each of said objects;

b. converting the signals into a digital image where the pixel coordinates of the boundary of each object have been identified and stored as data;

c. calculating from said data a series of Fourier coefficients c_i associated with the boundary of the object;

d. testing a given number N of the Fourier coefficients, except for the zero order Fourier coefficient, in a predetermined order for absolute values which exceed a predetermined value and generating a series of integers s_n with values corresponding to the subscript of each coefficient tested having an absolute value exceeding the predetermined value, so that:

s_1 = the subscript value of the first Fourier coefficient tested whose absolute value exceeds the predetermined value;

s_2 = the subscript value of the next Fourier coefficient tested whose absolute value exceeds the predetermined value; etc

e. calculating a first descriptor S as the number of Fourier coefficients c_{sn}, whose absolute values exceed the predetermined value, identified in step b;

f. calculating the greatest common divisor r of the integers:

$$s_n - s_1,\ n=2,\ldots,S \qquad \text{Eq. 9}$$

g. calculating an integer J which is the smallest of all integers R which satisfy the condition that r is the greatest common divisor of the integers:

$$s_n - s_1,\ n=2,\ldots,R \qquad \text{Eq. 10}$$

h. calculating second descriptors a_n as the absolute values of the Fourier coefficients c_1 whose absolute value exceeds the predetermined value, according to the definition:

$$a_n \Delta |c_{sn}|,\ n=1,\ldots,J \qquad \text{Eq. 11}$$

i. calculating a series of third descriptors $b_{n,j}$ according to the following definition:

$$b_{n,j} \Delta c_{s1}^{(sns)/r} c_{sj}^{(s1-sn)/r} c_{sn}^{(sj-s1)/r},\ n=J+1,\ldots,S;\ j=2,\ldots,J$$

j. storing at least the first, second and third descriptors in a digital memory; and

k. comparing the stored descriptors with descriptors of other objects calculated according to steps c–i to thereby automatically recognize objects of the same shape.

4,573,198

OPTICAL IMAGE PROCESSING/PATTERN RECOGNITION SYSTEM

Robert H. Anderson, Long Beach, Calif., assignor to Litton Systems, Inc., Beverly Hills, Calif.

Filed Dec. 27, 1982, Ser. No. 432,831
Int. Cl.[4] G06K 9/76
U.S. Cl. 382—31 **2 Claims**

1. A pattern recognition system comprising:

(a) means for producing a first light beam;

(b) a first magneto-optic display assembly disposed in said first light beam;

(c) a second magneto-optic display assembly disposed in said first light beam after said first magneto-optic display assembly;

(d) a first vidicon tube;

(e) first focusing means disposed in said first light beam after said second magneto-optic display assembly for focusing said first light beam on said first vidicon tube;

(f) means for forming a second light beam with a first pattern impressed thereon;

(g) a second vidicon tube;

(h) second focusing means disposed in said second light beam for focusing said second light beam on said second vidicon tube;

(i) first signal processing means for receiving and placing the output signal from said second vidicon tube in a usable form;

(j) a first digitizer connected to receive the signal from said first signal processing means and digitize it;

(k) first driver means connected between said first magneto-optic display assembly and said first digitizer for driving

said first magneto-optic display assembly as a function of the signal from said first digitizer;

(l) means for forming a third light beam;

(m) a third vidicon tube;

(n) a third magneto-optic display assembly disposed in said third light beam;

(o) third focusing means disposed in said third light beam for focusing said third light beam on said vidicon tube;

(p) second signal processing means for receiving and placing the output signal from said third vidicon tube in a usable form;

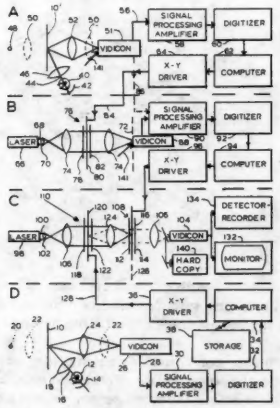
(q) a second digitizer connected to receive the signal from said second signal processing means and digitize it;

(r) second driver means connected between said second magneto-optic display assembly and said second digitizer for driving said second magneto-optic display assembly as a function of the signal from said second digitizer;

(s) means for forming a fourth light beam with a second pattern impressed thereon;

(t) a fourth vidicon tube;

(u) fourth focusing means disposed in said fourth light beam



for focusing said fourth light beam on said fourth vidicon tube;

(v) third signal processing means for receiving and placing the output signal from said fourth vidicon tube in a usable form;

(w) a third digitizer connected to receive the signal from said third signal processing means and digitize it;

(x) third driver means connected between said third magneto-optic display assembly and said third digitizer for driving said third magneto-optic display as a function of the signal from said third digitizer whereby said first magneto-optic display assembly contains the image of said first pattern and said second magneto-optic display assembly contains the image of the spatial filter pattern of said second pattern; and,

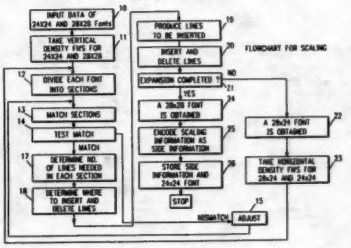
(y) means operably connected to the output of said first vidicon for evaluating the correlation of the Fourier transform of said first pattern to said spatial filter pattern of said second pattern as impressed on said first light beam by said first and second magneto-optic display assembly whereby the degree of correlation match indicates the probability of a pattern match between said first and second patterns.

4,573,199

KANJI/CHINESE FONT GENERATION BY SCALING

Shu-Chun Chen, Ossining, and Samuel C. Tseng, Pleasantville, both of N.Y., assignors to International Business Machines Corp., Armonk, N.Y.

Filed May 9, 1984, Ser. No. 608,608
Int. Cl.[4] G06K 9/42
U.S. Cl. 382—47 **5 Claims**


INPUT DATA OF 24X24 AND 28X28 Fonts
TAKE VERTICAL DENSITY FWS FOR 24X24 AND 28X28
DIVIDE EACH FONT INTO SECTIONS
MATCH SECTIONS
TEST MATCH
MATCH
DETERMINE NO. OF LINES NEEDED IN EACH SECTION
DETERMINE WHERE TO INSERT AND DELETE LINES
PRODUCE LINES TO BE INSERTED
INSERT AND DELETE LINES
EXPANSION COMPLETED ?
YES
A 28x28 FONT IS OBTAINED
ENCODE SCALING INFORMATION AS SIDE INFORMATION
STORE SIDE INFORMATION AND 24x24 FONT
STOP
MISMATCH
ADJUST
A 28x28 FONT IS OBTAINED
TAKE HORIZONTAL DENSITY FWS FOR 28x24 AND 24x24
FLOWCHART FOR SCALING

1. A data compression machine method for storing a complex character font from which an enlarged font can be generated by scaling with the insertion of horizontal and vertical lines into the stored font, comprising the steps of

storing a representation of the dot matrix of each character in a first font of complex characters,

partitioning each stored dot matrix into sections, each section containing a very pronounced and recognizable portion of the complex character represented by that matrix,

for each section of a partitioned dot matrix, deciding in which sections to insert horizontal and vertical lines so that enlargement is attained without distorting the basic overall shape of the character,

then deciding where in the partitioned sections the lines are to be inserted and what the inserted lines are to look like, and

storing the information as to where the lines are to be inserted and what the inserted lines are to look like as side information with the originally stored font of characters, whereby an enlarged font of characters which closely resembles the stored font of characters can be produced on the fly from the data representing the stored font of characters and the side information.

4,573,200

VIDEO NORMALIZATION FOR HAND PRINT RECOGNITION

Gregory M. Bednar, Matthews; Brian E. Fitzpatrick, Charlotte; John C. Harmon, Concord, and Manthri S. I. Narasimha, Charlotte, all of N.C., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 27, 1982, Ser. No. 453,018
Int. Cl.[4] G06K 9/42
U.S. Cl. 382—47 **2 Claims**

1. A method of obtaining a normalized representation of fixed dimensions of a variable size, hand printed character comprising the steps of:

scanning said character,

storing a bit representation of said scanned character in a video line buffer, said bit representation comprising a matrix of rows and columns of bits,

determining the height and width of said matrix representation,

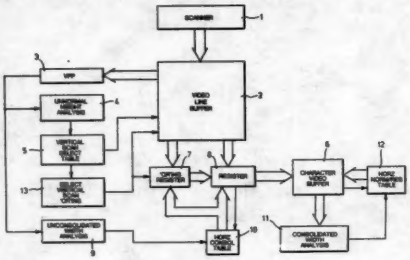
selecting rows of said matrix representation for subsequent processing in accordance with said height, said rows being selected individually or logically OR combined with an adjacent row,

separating each selected row into a plurality of separate groups and logically combining the bits in each separate

group so as to provide a row of bits of a fixed length for each said selected row, said groups being combined in accordance with said width,

storing each said row of fixed length in a character video buffer,

OR combining each bit in each row of fixed length with all the bits in the corresponding position of each of the other



rows, said combining indicating the actual width of said fixed length rows containing character information, and

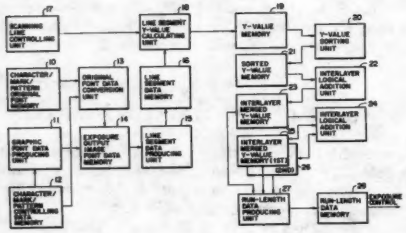
selectively deleting columns of bits in said fixed length rows in accordance with said combining indicating the actual width so as to further reduce said fixed length rows to an optimal minimum width capable of being recognized by a character recognition system.

4,573,201

DATA PROCESSING METHOD OF BINARY GRAPHIC PATTERN AND SYSTEM THEREFOR

Hideshi Hashiyama; Shuichi Araki, both of Kyoto, and Michio Ogura, Shiga, all of Japan, assignors to Dainippon Screen Seizo Kabushiki Kaisha, Kyoto, Japan

Filed Nov. 30, 1983, Ser. No. 556,431
Claims priority, application Japan, Dec. 1, 1982, 57-211155
Int. Cl.[4] G06K *9/50*
U.S. Cl. 382—56 **10 Claims**



1. A method for converting a graphic pattern expressed in terms of binary signals into run-length data so as to duplicate and record the graphic pattern, said method including storing the graphic pattern in a memory on the basis of data on the contours of the graphic pattern and controlling the output of a one-dimensional output unit in accordance with the latter data, which method comprises:

outputting data on each of the line segments, which respectively and successively connect adjacent characteristic points on the contours of the graphic pattern, in accordance with the coordinate values of the mutually-adjacent two characteristic points between which the line segment extends;

determining the Y-coordinate value of the crossing point between each scanning line in the Y-axis direction and each of the line segments in the one-dimensional output unit;

discriminating, on the basis of the order of each of the characteristic points and the relative magnitude of the X-coordinate value of each of the adjacent characteristic points, whether the crossing point is positioned at either the leading edge portion or the trailing edge portion of the black region of the pattern relative to the scanning direction of the scanning line; and

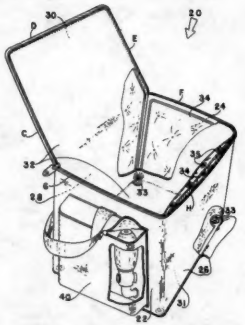
controlling the output of the one-dimensional output unit in accordance with the Y-coordinate value of the crossing point and the result of the discrimination.

4,573,202

CONTAINER WITH INFLATABLE, FLOATING LINER OF UNIFORM THICKNESS

Aaron Lee, 1427 39th Ave., San Francisco, Calif. 94122

Filed Jan. 20, 1984, Ser. No. 572,449
Int. Cl.[4] A45C *7/00*
U.S. Cl. 383—3 **13 Claims**



1. A container with internal cushioning, comprising:

a casing having side, top, and bottom walls which define a storage compartment, said casing having a closeable opening,

lining means consisting of an inner liner covering the entire inside of said opening and attached to said casing over the entire periphery of said opening except for one edge so as to form a slot for access to the space between said casing, and said liner,

securement means for attaching said liner to the inner surface of said casing at a plurality of places,

a removable inflatable envelope made of two sheets of an air-impermeable material having a pattern in conformity with the inner surfaces of said casing and forming a hermetically-sealable cavity, said envelope being sized for insertion, via said slot, into said space between said casing and said liner, said two sheets of said envelope being sealed together at their edges, said envelope being positioned in said space between said casing and said liner, said envelope being held in position by said liner,

captivating means for closing said slot after said envelope has been inserted into said space,

inflation means for inflating said envelope once it has been inserted into said space, and

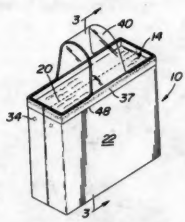
restraining means for maintaining said sheets of said envelope in parallel relationship when said envelope is in an inflated state, said restraining means comprising a plurality of attachment points which join said sheets together at a plurality of spaced locations thereon, an area on each of said sheets surrounding each attachment point being separable from the corresponding area of the other sheet so that said sheets will be spaced apart with maximal uniformity when said envelope is inflated.

4,573,203

REUSABLE PLASTIC BAG WITH LOOP HANDLE

Harry R. Peppiatt, Doylestown, Pa., assignor to Paramount Packaging Corp., Chalfont, Pa.

Filed Jun. 14, 1982, Ser. No. 388,381
Int. Cl.[4] B65D *33/10*
U.S. Cl. 383—8 13 Claims



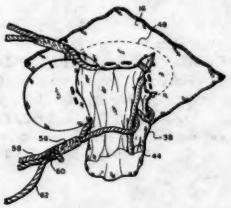
1. A bag comprising a unitary piece of flexible thermoplastic material including generally rectangular front and rear panels of flexible thermoplastic material overlying one another and a gusset integral in one piece with said panels and extending between the edges of said panels along one end of said panels to form a closed end of the bag, said gusset being flexible and having a fold line located between said panels and defining the inner boundary of said gusset, each panel having a fold line at said one end defining the outer boundary portion of said gusset, the other end of said panels being open to facilitate introducing goods into the bag, the side edges of said panels and said gusset being connected together in a manner so that the bag when filled can approximate the shape of a hexahedron with said gusset being flattened to form a substantially planar closed end of the bag, a flexible handle defined by a loop of thermoplastic material collapsible on itself, each end of said loop being welded to a separate one of said panels outside and adjacent the outer boundary portion of said gusset by a weld zone at the loop end, said gusset including frangible means integral therewith to facilitate access to goods in the bag and thereafter permit reuse of the bag, said frangible means facilitating provision of an elongated opening in the gusset substantially perpendicular to the length of the handle, and said loop being longer than the transverse width of the gusset so that a person's arm may extend through the loop for the purpose of supporting the bag when said gusset is flattened.

4,573,204

SLIDE FASTENER FOR FLEXIBLE BULK CONTAINER

Walter J. Polett, 61 Algonquin Trail, Medford Lakes, N.J. 08055

Filed Mar. 21, 1984, Ser. No. 591,698
Int. Cl.[4] B65D *33/28, 33/36;* F16G *11/04*
U.S. Cl. 383—41 3 Claims



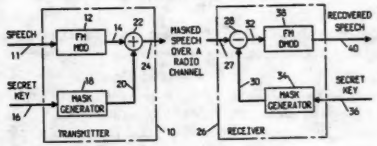
1. In a flexible bulk container including a bag portion having a top wall, a bottom wall and an encircling side wall connected to said top and bottom walls defining the outer perimeter of said bag portion and further including a filling spout secured to said top wall for filling said bag portion and a discharge spout secured to said bottom wall for discharging material from said bag portion, each of said spouts including a cord attached thereto intermediate the ends of said cord and which is adapted to be tightened around its respective spout for closing the same, the improvement comprising a pocket formed in the wall around each spout, each spout being adapted to be folded and inserted into its respective pocket; each pocket being comprised of a plurality of flaps which are adapted to be moved between open and closed positions, a pull cord for holding said flaps in said closed position with the respective spout inserted within said pocket; a fastener for holding each of said cords in a tightened position after the cord has been tightened around its associated spout for closing the same or for holding the cord in a position wherein it closes its associated flaps; each of said fasteners being comprised of an element having an aperture therein through which both ends of one of said cords are passed, the inner diameter of said aperture being such that it frictionally engages the cord so that said element can be manually slid across its respective cord ends between a closed position and an open position, said element tending to remain in any position in which it is placed; the fastener associated with the discharge spout having an additional cord attached thereto so that said fastener can be operated and slid into an open position from a remote location.

4,573,205

TECHNIQUE FOR SECURE COMMUNICATIONS ON FM RADIO CHANNELS

Randy D. Nash, Ocean, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Aug. 22, 1983, Ser. No. 525,279
Int. Cl.[4] H04K *1/02*
U.S. Cl. 455—30 19 Claims



11. A method of providing secure communications comprising the steps of:

at a transmitter,

(a) converting an input analog signal to a frequency modulated (FM) output signal at nominal carrier frequency;

(b) generating an output masking signal which is limited to the band of the FM output signal and includes a predetermined threshold level such that when said masking signal is added to the FM output signal a resultant signal is generated which is unintelligible when received with a conventional FM receiver; and

(c) directly adding the FM output signal from step (a) and the output masking signal from step (b) for generating a transmitter output signal.

4,573,206

METHOD AND MEANS FOR ALLOCATING THE VOLUME OF TRAFFIC OVER DIFFERENT CONTROL CHANNELS OF A CELLULAR RADIO SYSTEM

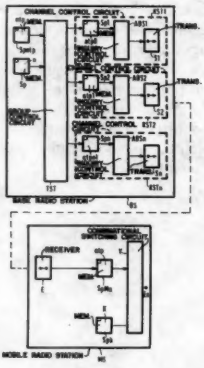
Christoph Grauel, Feucht, Fed. Rep. of Germany; Philippe Duplessis, and Alain Tarabout, both of Velizy Cedex, France, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 16, 1983, Ser. No. 562,382

Claims priority, application Fed. Rep. of Germany, Dec. 17, 1982, 3246742

Int. Cl.[4] H04B 7/00; H04Q 7/02

U.S. Cl. 455—33 11 Claims



1. A process for spreading the volume of traffic over different control channels of a radio communication system in which a plurality of base radio stations form a cellular system of radio zones in a geographical arrangement, the base radio station of each zone having a plurality of control channels and traffic channels allocated thereto over which it communicates with a plurality of mobile radio stations in such zone, such process comprising:

dividing the total number of mobile radio stations in the radio communication system into a number of groups (ntp) identified by respective channel group codes (atp), each such channel group code (atp) corresponding to a range of identifying group code numbers (K);

storing in each mobile radio station (BS) a particular identifying code number (K) which identifies such mobile radio station (BS);

transmission by each base radio station (BS) of respective channel group codes (atp) on the respective control channels (CCH) allocated to it, and reception from such control channels (CCH) of such channel group codes (atp) by the mobile radio stations (MS) in the zone of such base radio station (BS);

causing each mobile radio station (MS) to compare the channel group codes (atp) received thereby with the identifying code number (K) stored therein to select the channel group code (atp) which corresponds to such stored identifying code number (K);

and causing each mobile radio station (MS) to assign itself to the control channel (CCH) which corresponds to the channel code group (atp) selected by such mobile radio station (MS).

4,573,207

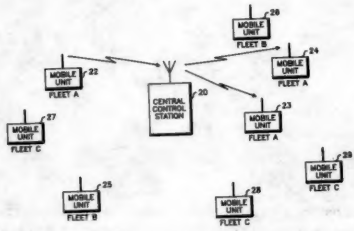
QUEUED COMMUNITY REPEATER COMMUNICATIONS SYSTEM

Paul F. Smith, Fort Worth; Eric Schorman, Bedford; Tim Burke, Fort Worth, and Chuck Lynk, Bedford, all of Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 22, 1983, Ser. No. 564,950

Int. Cl.[4] H04B 1/00

U.S. Cl. 455—54 31 Claims



1. A communications system for a central control station and a plurality of remote units, each remote unit adapted to receive and transmit messages on a single communications channel, comprising:

(a) remote units arranged in predetermined groupings, each remote unit comprising:

means for generating a request for service for its particular group and transmitting said request to the central control station on the single communications channel; and

means for receiving a grant of service from the central control station authorizing real time utilization of the single communications channel by a particular group of remote units; and

(b) a central control station controlling access to the single communications channel, comprising:

means for detecting an end-of-transmission condition of a first remote unit of a first group;

means for establishing predetermined time periods following said detection on the single communications channel during which a remote unit of said second group may request service;

means for maintaining a grant of service to said first group of remote units following said predetermined time period whereby a second remote unit of said first group may transmit;

means for revoking said grant of service if said second remote unit does not transmit; and

means for receiving said second group remote unit request, generating a second group grant of service when said first group grant of service is revoked, and transmitting said second group grant of service to said second group.

4,573,208

COMPRESSED SINGLE SIDE BAND COMMUNICATIONS SYSTEM AND METHOD

Paul H. Jacobs, Fairport, and Douglas P. Collette, Stafford, both of N.Y., assignors to Aerotron, Inc., Raleigh, N.C.

Division of Ser. No. 384,148, Jun. 1, 1982, Pat. No. 4,539,707. This application Jan. 26, 1984, Ser. No. 558,046

Int. Cl.[4] H04B 1/76, 7/00

U.S. Cl. 455—71 6 Claims

5. A receiver comprising:

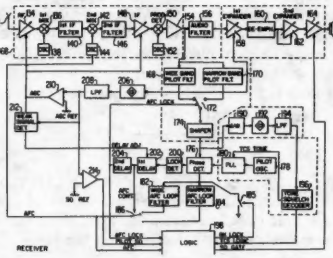
means for detecting a signal including an audio signal within an audio passband and a pilot tone having a frequency adjacent to but outside of said audio passband;

a VCO;

a phase detector;

means for applying to said VCO a control signal related in

amplitude to the phase of the detected signal, said means having a frequency response which passes noise at a frequency tending to drive said VCO to a frequency limit thereof to thereby locate the frequency of said pilot tone within the passband of the receiver.



4,573,209

FIXED STATION OF A RADIOCOMMUNICATIONS SYSTEM WITH FREQUENCY JUMPS AND TWO-WAY TRANSMITTERS

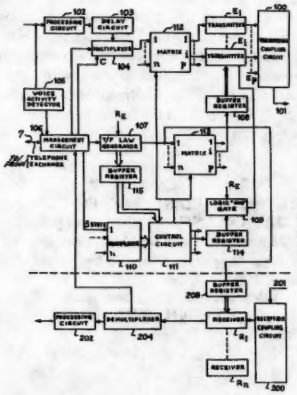
Pierre Deman, and Henri Butin, both of Paris, France, assignors to Thomson CSF, Paris, France

Filed May 20, 1983, Ser. No. 496,561

Claims priority, application France, May 27, 1982, 82 09259

Int. Cl.⁴ H04B *1/38*

U.S. Cl. 455—73 **3 Claims**



1. A fixed station of a frequency jump radiocommunications system in which transmissions take place on frequency ranges varying by synchronous jumps, comprising:

reception means for receiving signals;

n receivers coupled to said reception means;

n communications channels coupled to said n receivers, respectively;

p transmitters, each one having a connection input through which said one transmitter may be connected to said n channels, and each one having a frequency control input for transmitting on said frequency ranges varying by jumps, p being less than n;

n management circuits, each one of which correspond to one of said n channels, respectively, each said management circuit generating a signal indicative of an activity/nonactivity state of said corresponding channel;

n time/frequency law generators, each one of which corresponds to one of said n channels, respectively, each said time/frequency law generator providing said frequency ranges varying by jumps;

general control means for receiving said activity/nonactivity signals from said n management circuits and providing a connection control signal which assigns one of said n channels to one of said p transmitters, and for providing transmission authorization signals to said p transmitters to authorize said transmission;

first connection matrix means connected between said n channels and said p transmitters, for receiving said connection control signal and connecting one of said n channels to the connection input of one of said p transmitters;

second control matrix means, connected between said n time/frequency law generators and said p transmitters, for receiving said connection control signal and connecting one of said time/frequency law generators to the frequency control input of one of said p transmitters.

4,573,210

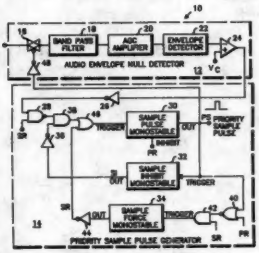
NULL INITIATED METHOD AND SYSTEM FOR MONITORING A PRIORITY CHANNEL

Joseph P. Heck, Ft. Worth, Tex., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 27, 1983, Ser. No. 565,948

Int. Cl.⁴ H03J *7/20*

U.S. Cl. 455—166 **22 Claims**



1. A method of monitoring one or more priority channels with minimal signal loss on nonpriority channels in a multichannel radio receiver, comprising:

receiving a demodulated audio signal on a nonpriority channel;

detecting nulls in said received demodulated audio signal; and

sampling the priority channel for a priority sampling period for a received signal during each of said null to avoid disruption in said nonpriority received signal.

4,573,211

TWO-CIRCUIT RESONANT BANDPASS FILTER FOR TELEVISION TUNERS

Karl H. Kupfer, Krefeld, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 4, 1983, Ser. No. 481,537

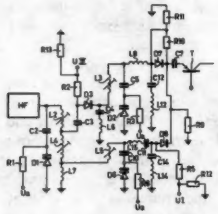
Claims priority, application Fed. Rep. of Germany, Apr. 6, 1982, 3212731

Int. Cl.⁴ H03J *5/00*

U.S. Cl. 455—188 **4 Claims**

1. A two-cricuit resonant bandpass filter for television tuners having electronic switches for switching the filter from a lower frequency band to a higher frequency band, characterized in that said bandpass filter comprises a primary partial filter section and a first and a second secondary partial filter section each coupled to said primary partial filter section, a mixing stage being coupled to said first and second secondary

partial filter section via respective electronic switches, and a further electronic switch being arranged between said primary partial filter section and said second secondary partial filter section so that when said further electronic switch is closed, the coupling between said primary partial filter section and



said first secondary partial filter section is substantially short-circuited via reactances which are low-ohmic for said lower frequency band and, when said further electronic switch is opened, the second secondary partial filter section is separated from said primary partial filter section.

4,573,212

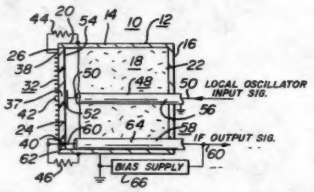
INTEGRATED RECEIVER ANTENNA DEVICE

Stephen E. Lipsky, Rydal, Pa., assignor to American Electronic Laboratories, Inc., Colmar, Pa.

Filed Nov. 21, 1983, Ser. No. 553,541

Int. Cl.[4] H04B *1/18, 1/26;* H01Q *1/36*

U.S. Cl. 455—282 **28 Claims**



1. An integrated receiver antenna device comprising a pair of antenna elements providing a spiral antenna for receiving radio frequency signals over a broadband of frequencies with an extended high frequency limit, the elements each having first and second ends and providing a pair of interwound conductive windings with their first ends positioned proximate to each other at the center of the antenna for providing sensitivity at the high frequency limit of received radio frequency signals and having their second ends displaced from the first ends and positioned at the periphery of the antenna, a flat plate of non conductive material supporting on a flat surface thereof the conductive windings of the spiral antenna, a supporting body having a conductive wall with an opening providing a cavity therein, and in which the plate is supported over the opening of the body for enclosing its cavity, a detector mixer unit connected between and positioned proximate to the first ends of the antenna elements for deriving radio frequency signals received by the antenna elements, signal input means for supplying an input signal providing an oscillating signal at the detector mixer unit for producing an output signal by the detector mixer unit which is an intermediate frequency signal, and signal output means connected to the antenna elements at a location substantially displaced from the detector mixer unit for delivering the output signal from locations proximate to the second ends of the antenna elements, and in which the signal input means includes a signal conducting means having a first signal conductor providing the input signal to the detector mixer unit and a second conductor which is returned to the conductive wall of the body, and the signal output means includes signal conducting means having a first conductor connecting with one of the second ends of the pair of windings of the antenna and a second conductor returned to the conductive wall of the body and first and second signal terminating means respectively returning the second ends of the antenna elements to the conductive wall of the body, and the signal output means delivers a biasing signal to the detector mixer unit through the antenna elements.

4,573,213

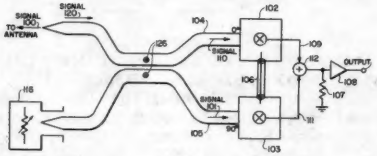
DUAL GUNN DIODE SELF-OSCILLATING MIXER

Samuel Dixon, Jr., Neptune, and Harold Jacobs, West Long Branch, both of N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jun. 27, 1983, Ser. No. 507,886

Int. Cl.[4] H04B *1/26*

U.S. Cl. 455—330 **10 Claims**



1. A mixer device comprising in combination:

two cavities, each including a self-oscillating negative resistance device, injection locked together by a connecting means, said connecting means being adjustable in length such that it is compatible with a 180° phase difference which exists between the locked together cavities;

means to feed an input signal to the cavities;

means for outputting signals from said negative resistance devices in the injection locked cavities and

means for combining these signals to form a mixed signal.

4,573,214

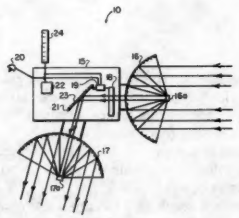
SATELLITE MOUNTED SYSTEM FOR TRANSFERRING INFORMATION USING MODULATED SUNLIGHT

Gregory C. Mooradian, Del Mar, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 12, 1981, Ser. No. 234,059

Int. Cl.[4] H01Q *1/28;* H04B *9/00*

U.S. Cl. 455—605 **10 Claims**



1. A method of transferring information via modulated sunlight from space to earth comprising the steps of:

orbiting a platform within the earth's gravitational field;

receiving sunlight on the orbiting platform;

modulating the received sunlight on the orbiting platform; and

directing the modulated sunlight to earth.

4,573,215

OPTICAL DATA DISTRIBUTION NETWORK WITH LISTEN-WHILE-TALK CAPABILITIES

Robert M. Oates, Murrysville; Herbert C. Cooper, North Huntingdon, and Kirk D. Houser, Ross Township, Allegheny County, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Feb. 21, 1984, Ser. No. 582,208

Int. Cl.[4] H04B *9/00*

U.S. Cl. 455—607 **5 Claims**

1. An optical data distribution network including a plurality of drops and means for distributing optical data signals to said plurality of drops, each drop having listen-while-talk capability, each drop comprising:

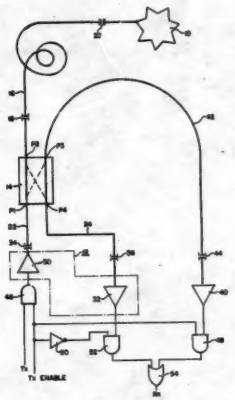
an optical signal directional coupler;

an optical transmitter, coupled to said directional coupler, for transmitting optical signals thereto;

a first optical receiver, coupled to said directional coupler, for receiving optical signals therefrom;

a single length of optical fiber for propagating transmit and receive optical signals between said directional coupler and said distributing means, said directional coupler operative to direct said transmit optical signals from said optical transmitter to said single length of optical fiber and to direct said receive optical signals from said single length of optical fiber to said first optical receiver;

a second optical receiver, coupled to said directional coupler, for receiving optical signals transmitted by said optical transmitter as directed to said second optical receiver by said directional coupler, thereby providing listen-while-talk capability; and

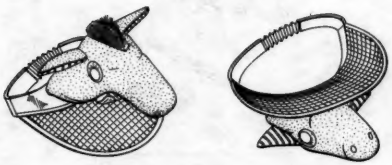


means for selecting between said first and second optical receivers to choose a receive signal therefrom.

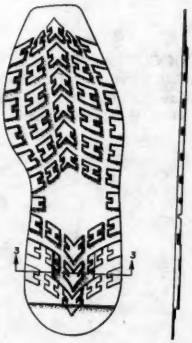
DESIGNS

FEBRUARY 25, 1986

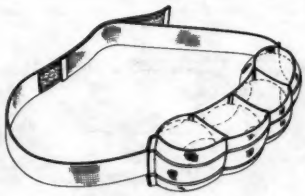
282,692
SUN VISOR OR SIMILAR ARTICLE
Hsin-Hui Chiang, Taipei, Taiwan, assignor to Asian Star U.S.A., Inc., Galveston, Tex.
Filed Mar. 28, 1984, Ser. No. 594,335
Term of patent 14 years
U.S. Cl. D2—252



282,693
SHOE SOLE
Randall R. Brayer, Uniontown, Ohio, and Leon W. Pillsbury, Jr., Windsor, Vt., assignors to The Goodyear Tire & Rubber Company, Akron, Ohio
Filed Aug. 22, 1983, Ser. No. 525,069
Term of patent 14 years
U.S. Cl. D2—320

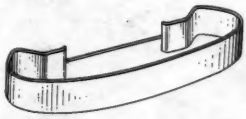


282,694
BELT-TYPE GARMENT FOR CARRYING TENNIS BALLS
Christian Gault, Paris, France, assignor to Ball-Sash, Inc., New York, N.Y.
Filed May 19, 1983, Ser. No. 496,246
Term of patent 14 years
U.S. Cl. D2—381

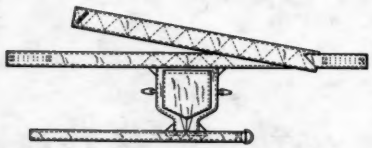


282,695
ORNAMENTAL SCARF PIN
Nancy R. Danniger, 406 S. Alandele Ave., Los Angeles, Calif. 90036
Filed Sep. 19, 1983, Ser. No. 533,350
Term of patent 14 years
U.S. Cl. D2—405

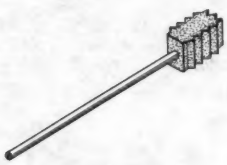
282,696
ORNAMENTAL SCARF PIN
Nancy R. Danniger, 406 S. Alandele Ave., Los Angeles, Calif. 90036
Filed Aug. 9, 1983, Ser. No. 521,548
Term of patent 14 years
U.S. Cl. D2—407



282,697
BABY CARRIER
Cyndy Allen, R.D. #1, Box 331, Jeffersonville, Vt. 05464
Filed Nov. 26, 1982, Ser. No. 432,285
Term of patent 14 years
U.S. Cl. D3—31



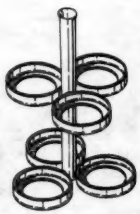
282,698
MOUTH CARE BRUSH
John J. Newton, Jr., Oak Park, Ill., assignor to Sage Products, Inc., Oak Park, Ill.
Filed Oct. 6, 1983, Ser. No. 539,578
Term of patent 14 years
U.S. Cl. D4—104



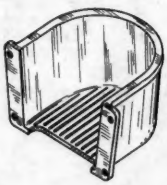
282,699
CHAIR FRAME
James R. Arthur, Jr., Birmingham, Ala., assignor to Marathon Corporation, Birmingham, Ala.
Filed Sep. 14, 1983, Ser. No. 532,148
Term of patent 14 years
U.S. Cl. D6—373

282,700
CHAIR FRAME
James R. Arthur, Jr., Birmingham, Ala., assignor to Marathon Corporation, Birmingham, Ala.
Filed Sep. 14, 1983, Ser. No. 532,154
Term of patent 14 years
U.S. Cl. D6—373

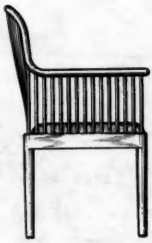
282,701
POT HOLDER
Norman E. Tomlin, Chung Hom Kok, Hong Kong, assignor to Tomex Limited, Wanchai, Hong Kong
Filed Aug. 26, 1983, Ser. No. 526,658
Claims priority, application United Kingdom, Mar. 14, 1983, 1 011 960
Term of patent 14 years
U.S. Cl. D6—405



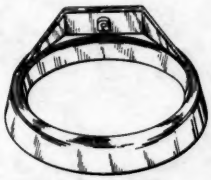
282,702
DRINK CONTAINER HOLDER
Steven M. Maus, 16220 Territorial Rd., Osseo, Minn. 55369
Filed May 31, 1983, Ser. No. 499,267
Term of patent 14 years
U.S. Cl. D6—573



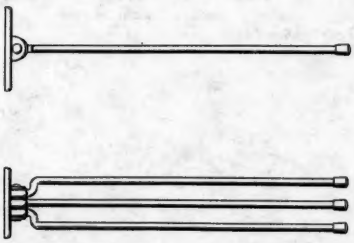
282,703
CHAIR
Davis B. Allen, New York, N.Y., assignor to Skidmore, Owings & Merrill, New York, N.Y.
Filed Sep. 8, 1983, Ser. No. 530,400
Term of patent 14 years
U.S. Cl. D6—370



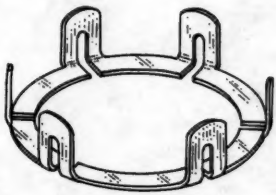
282,704
PLANT HOLDER
Rex A. Burnett, 210 N. Reed St., Warsaw, Ind. 46580
Filed Sep. 23, 1983, Ser. No. 535,314
Term of patent 14 years
U.S. Cl. D6—556



282,705
WALL MOUNTED RACK
John P. Chap, Lemont, Ill., assignor to Selfix, Inc., Chicago, Ill.
Filed Feb. 7, 1983, Ser. No. 463,343
Term of patent 14 years
U.S. Cl. D6—566

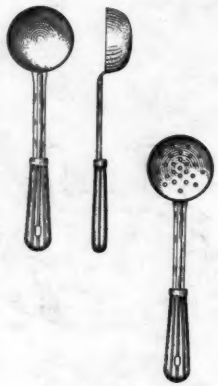


282,706
POT OR PAN RESTRAINT FOR ENGAGING THE RADIAL BARS OF RECREATIONAL VEHICLE STOVE TOP GRATINGS
Dominic J. DiFede, 2431 Tartarian Way, Union City, Calif. 94587
Filed May 6, 1983, Ser. No. 492,054
Term of patent 14 years
U.S. Cl. D7—70

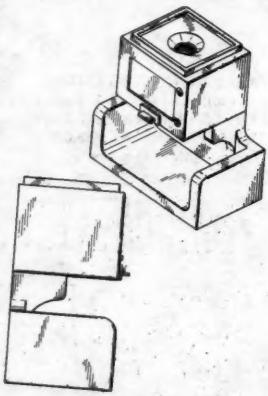


282,707
PORTABLE INSULATED CHEST
Charles Gretz, Suisun, Calif., and Gerald J. Kandel, Baltimore, Md., assignors to Life-Like Products, Inc., Baltimore, Md.
Filed Dec. 5, 1983, Ser. No. 558,035
Term of patent 14 years
U.S. Cl. D7—77

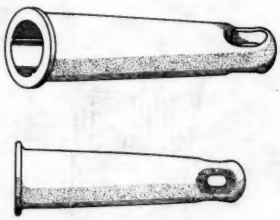
282,708
LADLE
Mary A. Schaeffer, Scotia, N.Y., assignor to The Vollrath Company, Sheboygan, Wis.
Filed Mar. 29, 1984, Ser. No. 594,841
Term of patent 14 years
U.S. Cl. D7—104



282,709
COFFEE MAKER
Douglas A. Albrecht; Donald L. Townsend, both of St. Louis, Mo., and Roger N. Underwood, Collinsville, Ill., assignors to Enterprise Coffee & Supply Company, St. Louis, Mo.
Filed Aug. 24, 1983, Ser. No. 516,878
Term of patent 14 years
U.S. Cl. D7—309

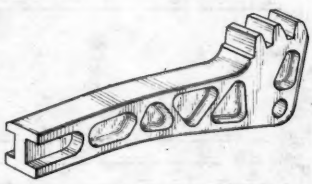


282,710
GARDEN TOOL HANDLE
Mike Vosbikian, 2607 River Rd., Cinnaminson, N.J. 08077
Filed Jul. 20, 1983, Ser. No. 515,218
Term of patent 14 years
U.S. Cl. D8—1

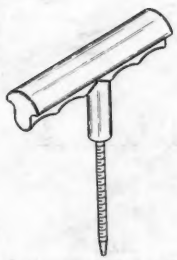


282,711
GARDEN MARKER STAKE
Marlyn N. O. Nelson, 7449 S. Linden Rd., Swartz Creek, Mich.
Filed May 26, 1983, Ser. No. 498,532
Term of patent 14 years
U.S. Cl. D8—1

282,712
ARM FOR RESCUE TOOL
George Rademacher, Box 3280 RFD, Long Grove, Ill. 60047
Filed May 23, 1983, Ser. No. 497,032
Term of patent 14 years
U.S. Cl. D8—14

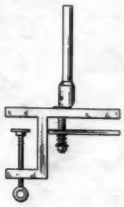


282,713
TIRE REPAIR TOOL
Robert Flory, Weber Falls, and Norman H. Bridge, Muskogee, both of Okla., assignors to Bridge Products, Inc., Northbrook, Ill.
Filed Mar. 2, 1983, Ser. No. 468,622
Term of patent 14 years
U.S. Cl. D8—31

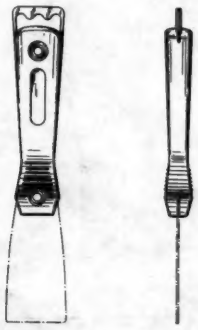


282,714
COMBINATION PULL TAB CAN AND BOTTLE OPENER
Frank T. Harvey, 35422 Blairmoor, Fraser, Mich. 48026
Filed Jun. 16, 1983, Ser. No. 505,068
Term of patent 14 years
U.S. Cl. D8—113

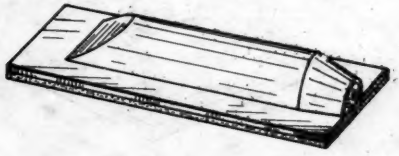
282,715
VICE CLAMP
Arthur T. Manning, 152 NE. 38 St., #79, Oakland Park, Fla. 33334
Filed May 16, 1983, Ser. No. 495,042
Term of patent 14 years
U.S. Cl. D8—72



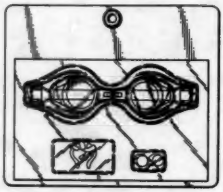
282,716
COMBINED HANGER AND HANDLE FOR HAND TOOLS
Robert Heinis, Totowa, and Daniel Podlesny, Landing, both of N.J., assignors to Red Devil, Inc., Union, N.J.
Filed May 11, 1983, Ser. No. 493,759
Term of patent 14 years
U.S. Cl. D8—107



282,717
WINDOW PULLEY SEAL
Gary D. Anderson, 920 W. 53rd St., Minneapolis, Mich. 55419
Filed Jun. 1, 1983, Ser. No. 499,850
Term of patent 14 years
U.S. Cl. D8—349

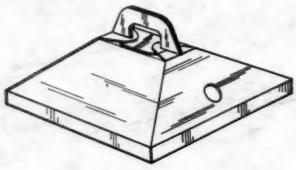


282,718
SWIMGEAR PACKAGE
Simon C. Fireman, Quincy, Mass., assignor to Aqua-Leisure Industries, Inc., Avon, Mass.
Filed Jul. 13, 1983, Ser. No. 513,303
Term of patent 14 years
U.S. Cl. D9—337

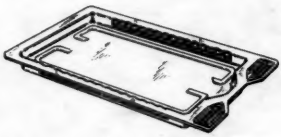


282,719
BOTTLE
Timothy Anscomb, Chailey, NR Lewes, United Kingdom, assignor to Schering - Prebbles Limited, Bootle, United Kingdom
Filed Feb. 3, 1983, Ser. No. 463,424
Claims priority, application United Kingdom, Aug. 3, 1982, 1008 105
Term of patent 14 years
U.S. Cl. D9—373

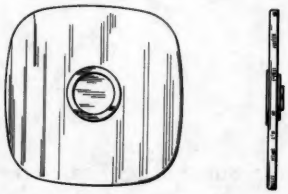
282,720
CARTON
Luke Borg, Rosebery, New South Wales, Australia, assignor to Fibre Containers Limited, New South Wales, Australia
Filed Mar. 31, 1983, Ser. No. 480,676
Term of patent 14 years
U.S. Cl. D9—418



282,721
TOWEL TRAY
Warde M. Cameron, Jr., Sandy, Utah, assignor to Warner-Lambert Company, Morris Plains, N.J.
Filed Jul. 29, 1983, Ser. No. 518,707
Term of patent 14 years
U.S. Cl. D9—425

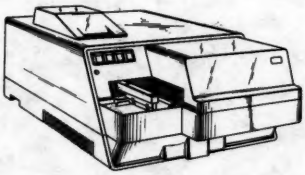


282,722
COVER FOR NEEDLE AND SYRINGE DISPOSAL CONTAINER OR THE LIKE
Timothy R. Lott, 2149 Sheridan Hills Rd., Wayzata, Minn. 55391
Filed Aug. 12, 1983, Ser. No. 522,484
Term of patent 14 years
U.S. Cl. D9—435

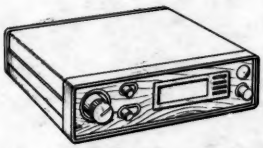


282,723
CLOCK
Paul D. MacNeal, 13953 Bermax Ave., Sylmar, Calif. 91342
Filed Aug. 4, 1983, Ser. No. 520,306
Term of patent 14 years
U.S. Cl. D10—21

282,724
SPECTRO PHOTOMETER
Kenneth D. Collister, and Steven C. Johnson, both of Elkhart, Ind., assignors to Miles Laboratories, Inc., Elkhart, Ind.
Filed Sep. 13, 1983, Ser. No. 531,773
Term of patent 14 years
U.S. Cl. D10—46



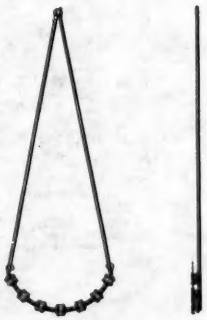
282,725
RADAR DETECTOR
Kazuyoshi Imazeki, Tokyo, Japan, assignor to General Research of Electronics, Inc., Tokyo, Japan
Filed May 23, 1983, Ser. No. 496,954
Term of patent 14 years
U.S. Cl. D10—104



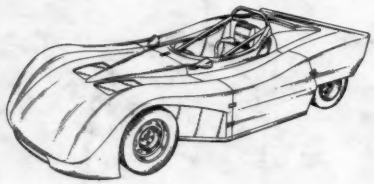
282,726
REFLECTOR
Hugh H. Dietz, Syracuse; Daniel S. Latham, North Syracuse, and Alfred G. Tienken, Syracuse, all of N.Y., assignors to R. E. Dietz, Syracuse, N.Y.
Filed Sep. 28, 1983, Ser. No. 536,636
Term of patent 14 years
U.S. Cl. D10—111

282,727
NECKLACE
Marina Bulgari, Athens, Greece, assignor to Marina B Creation S.A., Vaduz, Liechtenstein
Filed Aug. 15, 1983, Ser. No. 523,068
Claims priority, application Italy, Feb. 15, 1983, 35607/83[U]
Term of patent 14 years
U.S. Cl. D11—3

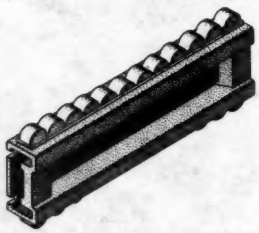
282,728
NECKLACE OR SIMILAR ARTICLE
Angela M. Spade, 814 Sixth Ave. N., Onalaska, Wis. 54650
Filed Nov. 7, 1983, Ser. No. 549,490
Term of patent 14 years
U.S. Cl. D11—6



282,729
SINGLE SEAT SPORTS CAR
Royston C. Lunn, Ann Arbor, Mich., assignor to Renault/Jeep Sport, Inc., Detroit, Mich.
Filed Oct. 20, 1983, Ser. No. 543,917
Term of patent 14 years
U.S. Cl. D12—88

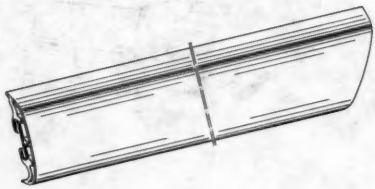


282,730
BICYCLE PEDAL TREAD
Carlton P. Pawsat, and David K. McMurtrey, both of Maysville, Ky., assignors to Wald Manufacturing Co., Inc., Maysville, Ky.
Filed Dec. 7, 1983, Ser. No. 559,032
Term of patent 14 years
U.S. Cl. D12—125

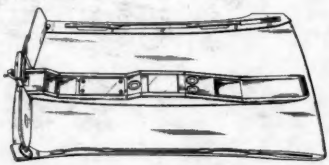


282,731
STROLLER HANDLE
James M. Kain, Tipp City, Ohio, assignor to Questor Corp., Tampa, Fla.
Filed Oct. 28, 1983, Ser. No. 546,766
Term of patent 14 years
U.S. Cl. D12—133

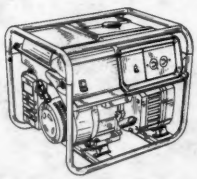
282,732
ELASTOMER REAR BUMPER GUARD FOR AUTOMOBILES
Claus Luthe, Munich, and Boyke Boyer, Seefeld, both of Fed. Rep. of Germany, assignor to Bayerische Motoren Werke AG, Fed. Rep. of Germany
Filed Apr. 8, 1983, Ser. No. 483,388
Claims priority, application Fed. Rep. of Germany, Oct. 11, 1982, MR 13163
Term of patent 14 years
U.S. Cl. D12—167



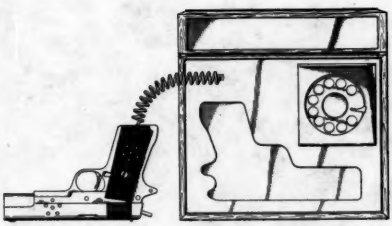
282,733
COMBINED INTERIOR ROOF LINING, REAR VIEW MIRROR, SUN VISORS AND OVERHEAD CONSOLE FOR AN AUTOMOBILE
Carlo Giavazzi, Milan; Ezio Villa, Arese, and Leonardo Dimora, Milan, all of Italy, assignors to Alfa Romeo Auto S.p.A., Naples, Italy
Filed Jul. 15, 1983, Ser. No. 514,001
Claims priority, application Italy, Jan. 20, 1983, 20540/83[U]
Term of patent 14 years
U.S. Cl. D12—195



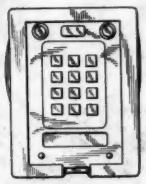
282,734
ENGINE GENERATOR
Toshihiko Shibuya, Urawa, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Feb. 23, 1983, Ser. No. 468,890
Claims priority, application Japan, Aug. 23, 1982, 57-38188
Term of patent 14 years
U.S. Cl. D13—1



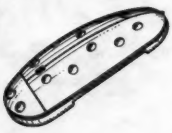
282,735
TELEPHONE SET
Thomas J. Tizzard, 804 Bristol Rd., San Dimas, Calif. 91773
Continuation-in-part of Ser. No. 553,121, Nov. 18, 1983, which is a continuation-in-part of Ser. No. 554,224, Nov. 21, 1983, which is a continuation-in-part of Ser. No. 561,274, Dec. 14, 1983, which is a continuation-in-part of Ser. No. 561,276, Dec. 19, 1983. This application May 8, 1984, Ser. No. 608,166
Term of patent 14 years
U.S. Cl. D14—53

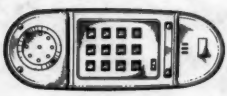


282,736
TELEPHONE
Paul R. Brown, 20 E. 35th St., New York, N.Y. 10016
Filed Aug. 22, 1983, Ser. No. 525,086
Term of patent 14 years
U.S. Cl. D14—53



282,737
TELEPHONE
Lobo Huang, Taipei, Taiwan, assignor to Karlee Enterprises, Inc., Lynnwood, Wash.
Filed Sep. 6, 1983, Ser. No. 529,564
Claims priority, application Taiwan, May 7, 1983, 7231942
Term of patent 14 years
U.S. Cl. D14—53





282,738

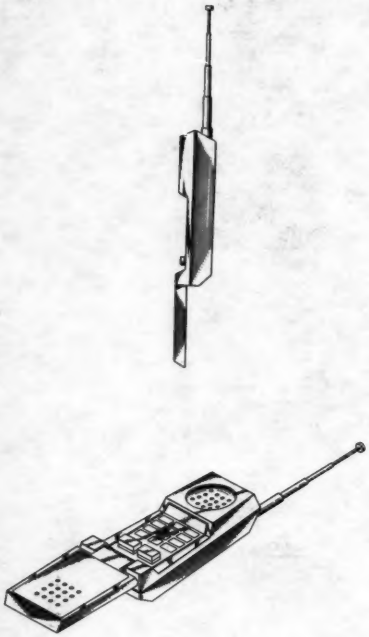
CORDLESS TELEPHONE HANDSET

Stephen A. Nichols, Indianapolis, Ind., assignor to Uniden Corporation of America, Indianapolis, Ind.

Filed Feb. 28, 1983, Ser. No. 470,776

Term of patent 14 years

U.S. Cl. D14—53



282,739

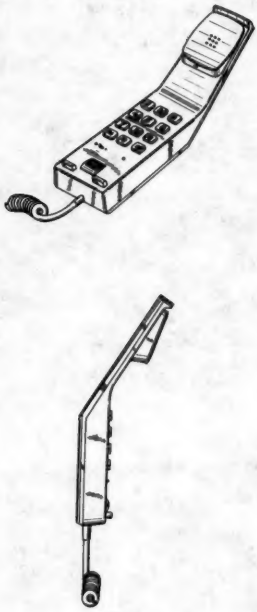
HANDSET TELEPHONE

Juhani Salovaara, Turku, Finland, assignor to Laukamo Oy, Somero, Finland

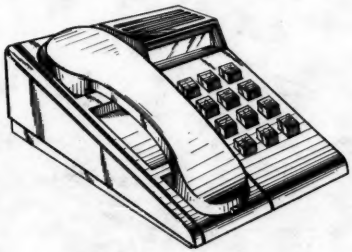
Filed Sep. 30, 1983, Ser. No. 537,951

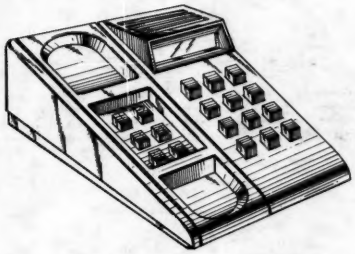
Term of patent 14 years

U.S. Cl. D14—53



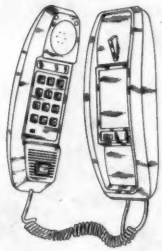
282,740
TELEPHONE SET
Robert M. Rood, 7164 Victoria Rd., St. Paul, Minn. 55119
Filed May 19, 1983, Ser. No. 496,254
Term of patent 14 years
U.S. Cl. D14—53

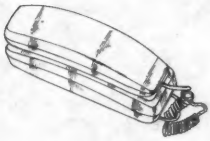




282,741
TELEPHONE SET
Denni F. Rivette, Chicago, and Jeffrey D. Breslow, Highland Park, both of Ill., assignors to Marvin Glass & Associates, Chicago, Ill.
Filed Aug. 3, 1983, Ser. No. 519,977
Term of patent 14 years
U.S. Cl. D14—53

282,742
TWO PIECE TELEPHONE
Elliot I. Baum, Dix Hills, N.Y., assignor to QT&T, Inc., Brentwood, N.Y.
Filed Jun. 13, 1983, Ser. No. 503,612
Term of patent 14 years
U.S. Cl. D14—53





282,743

TELEPHONE

Lobo Huang, Taipei, Taiwan, assignor to Karlee Enterprises, Inc., Lynnwood, Wash.

Filed Sep. 6, 1983, Ser. No. 529,406

Claims priority, application Taiwan, May 3, 1983, 7231860

Term of patent 14 years

U.S. Cl. D14—53

282,744

TELEPHONE

Lobo Huang, Taipei, Taiwan, assignor to Karlee Enterprises, Inc., Lynnwood, Wash.

Filed Sep. 6, 1983, Ser. No. 529,563

Term of patent 14 years

U.S. Cl. D14—53

282,745

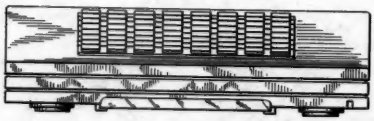
DIRECT STATION SELECTION CONSOLE

Wilbert C. Brown, Fairfield, Conn., assignor to TIE/Communications, Inc., Shelton, Conn.

Filed Jul. 18, 1983, Ser. No. 514,838

Term of patent 14 years

U.S. Cl. D14—58



282,746

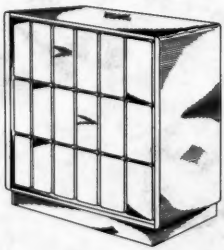
SPECIAL PURPOSE COMPUTER HOUSING

Logan W. Johnson, Edina; Richard E. Carlson, New Hope, both of Minn.; Michael E. McCadden, Centuria, Wis.; Richard E. Offerdahl, Little Canada, and Nicholas P. Van Brunt, White Bear Lake, both of Minn., assignors to Zycad Corporation, Arden Hills, Minn.

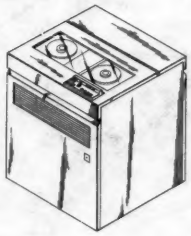
Filed Dec. 27, 1982, Ser. No. 453,146

Term of patent 14 years

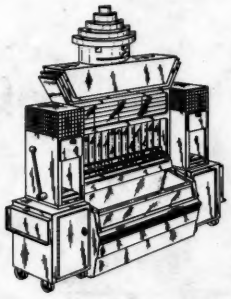
U.S. Cl. D14—102



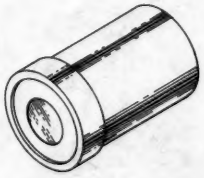
282,747
TAPE DRIVE
David M. Gresham, New Haven, Conn.; Ted F. Kelley, Rochester, Minn.; Philip C. Yenerich, and Roland Zapfe, both of Tucson, Ariz., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Mar. 14, 1983, Ser. No. 477,676
Term of patent 14 years
U.S. Cl. D14—108



282,748
ICE CREAM DISPENSING MACHINE
William H. Lebo, Leawood, Kans., assignor to Cone-A-Copia, Inc., Overland Park, Kans.
Filed Sep. 22, 1983, Ser. No. 534,232
Term of patent 14 years
U.S. Cl. D15—82

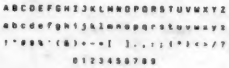


282,749
FLASH EXPOSURE DEVICE
John J. Owen, III, 3820 Ridgewood Dr., Smyrna, Ga. 30080
Filed Sep. 13, 1983, Ser. No. 521,188
Term of patent 14 years
U.S. Cl. D16—38

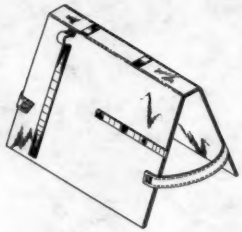


282,750
TYPEFACE
Hirozi Inazuka, Nagoya, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan
Filed Mar. 23, 1983, Ser. No. 477,966
Term of patent 14 years
U.S. Cl. D18—24

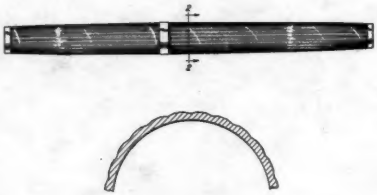
282,751
FONT OF TYPE
William R. Gardner, Wilton, and Paul G. Parenteau, Naugatuck, both of Conn., assignors to Exxon Research and Engineering Co., Florham Park, N.J.
Filed Apr. 11, 1983, Ser. No. 483,563
Term of patent 14 years
U.S. Cl. D18—24



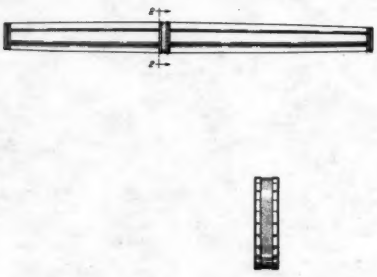
282,752
ARTIST BRUSH HOLDER
Mary P. Olivetti, 14911 Loretta Dr., La Mirada, Calif. 90638
Filed Jun. 20, 1983, Ser. No. 505,811
Term of patent 14 years
U.S. Cl. D19—26



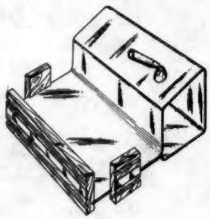
282,753
WRITING INSTRUMENT WITH A STRIPED BODY
Jacques LeBlanc, L'Isle Adam, France, assignor to The Parker Pen Company, Janesville, Wis.
Filed Dec. 27, 1983, Ser. No. 565,738
Term of patent 14 years
U.S. Cl. D19—49



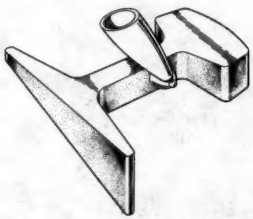
282,754
WRITING INSTRUMENT WITH FACETED TRIM RINGS
Jacques LeBlanc, L'Isle Adam, France; Gerald C. Herold, and E. Dale Thompson, both of Janesville, Wis., assignors to The Parker Pen Company, Janesville, Wis.
Filed Dec. 27, 1983, Ser. No. 565,739
Term of patent 14 years
U.S. Cl. D19—49



282,755
COMBINED PEN HOLDER AND DESK TRAY
Joseph Cohen, 18345 Cecelia Way, Cerritos, Calif. 90701
Filed Dec. 9, 1983, Ser. No. 559,632
Term of patent 14 years
U.S. Cl. D19—78



282,756
PEN HOLDER
Carl N. Sass, 2481 Verwood Dr., San Jose, Calif. 95130
Filed Jul. 25, 1983, Ser. No. 516,590
Term of patent 14 years
U.S. Cl. D19—82



282,757
CARD HOLDER
Joseph Cohen, 18345 Cecelia Way, Cerritos, Calif. 90701
Filed Dec. 9, 1983, Ser. No. 559,635
Term of patent 14 years
U.S. Cl. D19—86

282,758

HANGING FILE BINDER

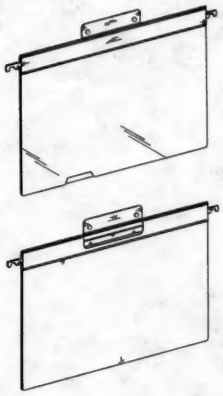
Karl Hirsch, Klagenfurt, Austria, assignor to Karl Hirsch Kunststofftechnik, Klagenfurt, Austria

Filed Nov. 6, 1981, Ser. No. 319,152

Claims priority, application Austria, May 13, 1981, 1539/81/Le

Term of patent 14 years

U.S. Cl. D19—91



282,759

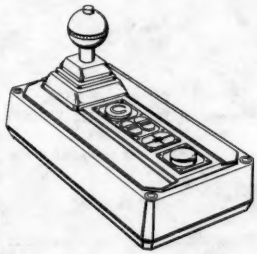
VIDEO GAME CONTROL UNIT

Gary S. Weissberg, 141 Roycroft Ave., Long Beach, Calif. 90813

Filed Sep. 30, 1983, Ser. No. 537,516

Term of patent 14 years

U.S. Cl. D21—48



282,760

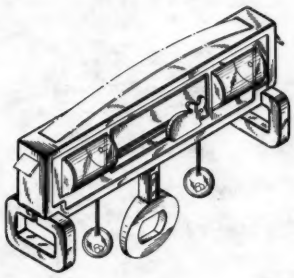
ACTIVITY TOY

Pietro Catelli, Como, Italy, assignor to Artsana S.p.A., Italy

Filed Jul. 28, 1983, Ser. No. 518,153

Term of patent 14 years

U.S. Cl. D21—63



282,761

TOY WHISTLE

Moriya Kino, No. 14-6-240, Mori 1-chome, Isogo-ku, Yokohami-shi, Kanagawa-ken, Japan

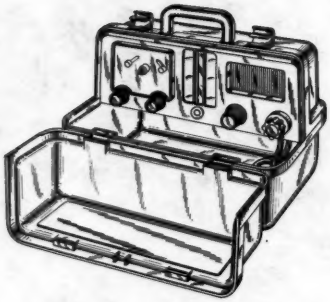
Filed Jun. 7, 1983, Ser. No. 501,843

Claims priority, application Japan, Oct. 25, 1982, 57-48524

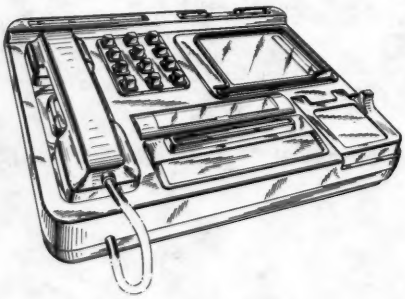
Term of patent 14 years

U.S. Cl. D21—64

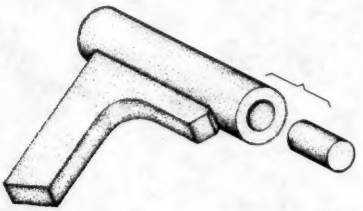
282,762
PLAY CASE FOR A TOY DOCTOR KIT OR SIMILAR ARTICLE
Pietro Catelli, Como, Italy, assignor to Artsana S.p.A., Italy
Filed Jul. 28, 1983, Ser. No. 518,131
Term of patent 14 years
U.S. Cl. D21—109

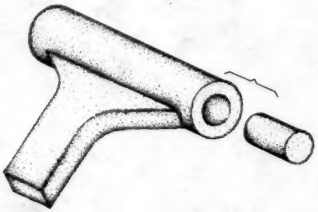


282,763
COMBINED TOY TELEPHONE AND DESK
Pietro Catelli, Como, Italy, assignor to Artsana S.p.A., Italy
Filed Jul. 28, 1983, Ser. No. 518,151
Term of patent 14 years
U.S. Cl. D21—111



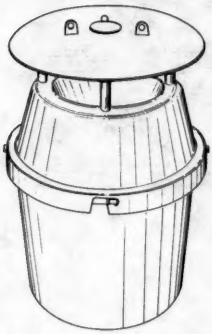
282,764
COMBINED TOY GUN AND PROJECTILE THEREFOR
Theresa M. Megargee, 14 Milo Dr., Madison, Conn. 06443
Filed Jun. 7, 1983, Ser. No. 501,797
Term of patent 14 years
U.S. Cl. D21—147



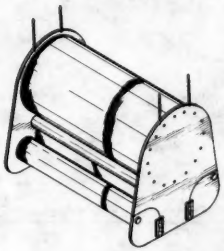


282,765
BLOW GUN
Ronald P. Shipman, P.O. Box 31246, Dallas, Tex. 75231
Filed May 16, 1983, Ser. No. 494,912
Term of patent 14 years
U.S. Cl. D22—3

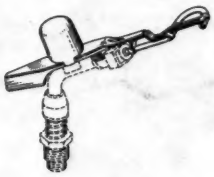
282,766
INSECT TRAP
Walter H. Nightingale, Clayton Rd., Birchwood, Warrington Cheshire WA3 6QQ, United Kingdom
Filed Apr. 1, 1983, Ser. No. 481,489
Claims priority, application United Kingdom, Oct. 6, 1982, 1009098
Term of patent 14 years
U.S. Cl. D22—19



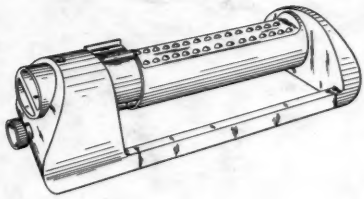
282,767
FILTER UNIT
Frederick M. Shofner, Knoxville, Tenn., assignor to PPM, Inc., Knoxville, Tenn.
Filed Apr. 6, 1982, Ser. No. 365,892
Term of patent 14 years
U.S. Cl. D23—4



282,768
SPRINKLER DRIVE ARM
Hans D. Christen, LaVerne, and David E. Robertson, Covina, both of Calif., assignors to Rain Bird Sprinkler Mfg. Corp., Glendora, Calif.
Filed Jul. 19, 1983, Ser. No. 515,298
Term of patent 14 years
U.S. Cl. D23—7



282,769
OSCILLATOR SPRINKLER
Jack L. Lemkin, Cincinnati, and Carl A. Peterson, Columbus, both of Ohio, assignors to O. M. Scott & Sons Company, Marysville, Ohio
Filed Nov. 2, 1983, Ser. No. 547,987
Term of patent 14 years
U.S. Cl. D23—8

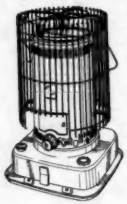


282,770
COMBINED PUMP AND NOZZLE FOR SPRAYER
Tetsuya Tada, Tokyo, Japan, assignor to Canyon Corporation, Tokyo, Japan
Filed Nov. 19, 1984, Ser. No. 672,805
Claims priority, application Japan, May 22, 1984, 59-20744
Term of patent 14 years
U.S. Cl. D23—17

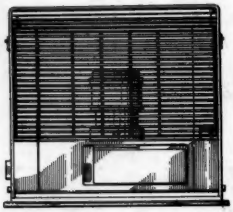
282,771
SHOT PEEN DISCHARGE NOZZLE
Billy E. Garrison, Canton, Ga., assignor to Lockheed Corporation, Burbank, Calif.
Filed Nov. 18, 1982, Ser. No. 442,516
Term of patent 14 years
U.S. Cl. D23—34

282,772
ASPIRATOR FITTING
William A. Fleury, 1927 Sparrow, Troy, Mich. 48084
Filed Nov. 29, 1982, Ser. No. 444,943
Term of patent 14 years
U.S. Cl. D23—43

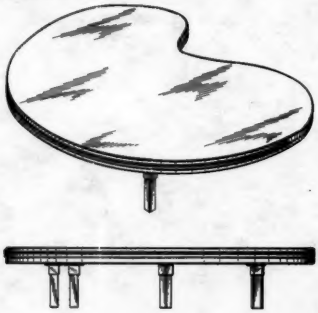
282,773
OIL HEATER
Nobuyuki Mase, and Daisaku Mori, both of Nara, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Aug. 8, 1984, Ser. No. 638,805
Claims priority, application Japan, Feb. 8, 1984, 59-4412; Feb. 8, 1984, 59-4413
Term of patent 14 years
U.S. Cl. D23—121



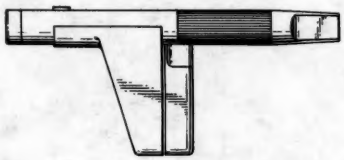
282,774
OIL-FIRED SPACE HEATER
Kazuharu Nakamura, Nagoya, Japan, assignor to Toyotomi Kogyo Co., Ltd., Aichi, Japan
Filed Nov. 23, 1984, Ser. No. 674,119
Claims priority, application Japan, May 22, 1984, 59-20890
Term of patent 14 years
U.S. Cl. D23—123



282,775
PLATFORM FOR REHABILITATION EXERCISE AND THERAPY
Charlton A. Floyd, Sr., Hopkins, S.C., assignor to J. A. Preston Corporation, Clifton, N.J.
Filed Sep. 23, 1983, Ser. No. 535,189
Term of patent 14 years
U.S. Cl. D24—3

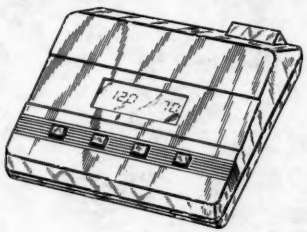


282,776
DEVICE FOR METERED DISPENSING OF DENTAL COMPOUNDS
Alexander Neumeister, Munich, Fed. Rep. of Germany, assignor to ESPE Fabrik pharmazeutischer Praeparate GmbH, Fed. Rep. of Germany
Filed May 3, 1983, Ser. No. 491,180
Claims priority, application Fed. Rep. of Germany, Nov. 4, 1982, 11 AR 3701/82
Term of patent 14 years
U.S. Cl. D24—10



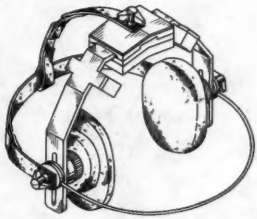
282,777
ORTHODONTIC LIGATURE WIRE CUTTER
Craven H. Kurz, 465 N. Roxbury Dr., #1011, Beverly Hills, Calif. 90210
Filed Sep. 29, 1982, Ser. No. 426,996
Term of patent 14 years
U.S. Cl. D24—10

282,778
DIGITAL ELECTRONIC BLOOD PRESSURE METER
Murray I. C. Camens, Groningen, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.
Filed Jan. 24, 1983, Ser. No. 460,332
Claims priority, application Japan, Aug. 6, 1982, 57-35511
Term of patent 14 years
U.S. Cl. D24—21

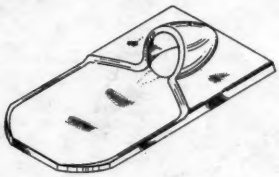


282,779
EAR STUD GUN
Vladimir Reil, 740 W. 16th St., San Pedro, Calif. 90731
Filed Jan. 12, 1983, Ser. No. 457,448
Term of patent 14 years
U.S. Cl. D24—23

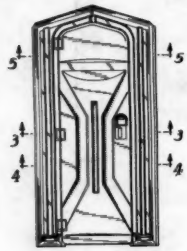
282,780
HEADSET FOR ESOPHAGEAL GASTRIC TUBE
Frederick W. Reece, 2929 35th St., Des Moines, Iowa 50310
Filed Apr. 1, 1983, Ser. No. 481,490
Term of patent 14 years
U.S. Cl. D24—34



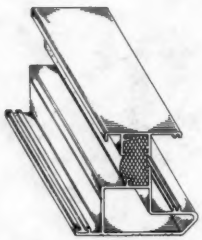
282,781
COLONIC IRRIGATION BOARD
Eldon L. Lowder, 7835 S. 1300 East, Sandy, Utah 84092
Filed Oct. 6, 1983, Ser. No. 539,650
Term of patent 14 years
U.S. Cl. D24—51



282,782
COMBINED BUILDING WALL AND DOOR UNIT
Phillip R. Juaire, Brooklyn Center; Fredric M. Wagner, Rogers, and Leo F. Wildgen, Bloomington, all of Minn., assignors to Satellite Industries, Inc., Minneapolis, Minn.
Filed Mar. 30, 1983, Ser. No. 480,404
Term of patent 14 years
U.S. Cl. D25—48

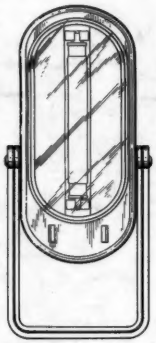


282,783
EXTRUDED INSULATED MOULDING FOR A STORM DOOR
Paul Rezewski, 11824-65 St., Edmonton, Alberta, Canada
Filed Mar. 28, 1983, Ser. No. 462,471
Term of patent 14 years
U.S. Cl. D25—74



282,784
FLUORESCENT LAMP
Toshiharu Fujita, Kanagawa; Fuminobu Takizawa, Yokohama, and Yoshihiro Domom, Kamakura, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Filed Oct. 14, 1983, Ser. No. 542,130
Claims priority, application Japan, Apr. 14, 1983, 58-15886; Sep. 26, 1983, 58-41775; Sep. 26, 1983, 58-41777; Sep. 26, 1983, 58-41779
Term of patent 14 years
U.S. Cl. D26—3

282,785
COMBINED MULTI-PURPOSE FLUORESCENT LANTERN AND EMERGENCY LIGHT
John S. Yuen, Kowloon, Hong Kong, assignor to John Manufacturing Limited, Kowloon, Hong Kong
Filed Oct. 5, 1983, Ser. No. 539,309
Claims priority, application United Kingdom, Apr. 11, 1983, 1012425
Term of patent 14 years
U.S. Cl. D26—42



282,786
COMBINED MATCH AND HOLDER FOR A CIGARETTE
Saeng K. Cho, 1428 Whitburn Ave., Fayetteville, N.C. 28304
Filed Jul. 18, 1983, Ser. No. 514,780
Term of patent 14 years
U.S. Cl. D27—30

282,787
COMBINED CART AND BOWLING BALL BAG
Henry L. Nichols, 301 E. Wildwood Ave., Fort Wayne, Ind. 46806
Filed Sep. 8, 1983, Ser. No. 530,413
Term of patent 14 years
U.S. Cl. D34—25

LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 25TH DAY OF FEBRUARY, 1986

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A L M: *See—*
Hubert, Jean, 4,572,493, Cl. 269-325.000.

A. O. Smith Harvestoe Products, Inc.: *See—*
Roberts, James R., 4,572,675, Cl. 366-263.000.

A/S Alfred Benzon: *See—*
Pedersen, Arne M.; and Jensen, Jens R., 4,572,833, Cl. 424-20.000.

A.T.B. S.p.A.: *See—*
Bordignon, Abramo, 4,573,095, Cl. 360-130.310.

A. W. Anderberg Manufacturing Co.: *See—*
Taylor, George A., 4,571,776, Cl. 16-339.000.

A. W. Chesterton Company: *See—*
Rockwood, Robert E.; Antkowiak, Richard P.; and Hill, Douglas J., 4,572,517, Cl. 277-53.000.

Aagano, Toshitaka; and Takasaki, Yoshimi, to Fuji Photo Film Co., Ltd. Temperature-controlled laser apparatus. 4,573,159, Cl. 372-34.000.

AB Electronic Components Limited: *See—*
Embrey, Derek M.; Webb, Stuart F.; and Legg, Graham J., 4,572,987, Cl. 315-77.000.

AB Linjebyggnad: *See—*
Kleveborn, Rolf, 4,572,329, Cl. 182-9.000.

AB Lofab-Square: *See—*
Jonsson, Lars E., 4,572,526, Cl. 279-4.000.

Abbott Laboratories: *See—*
Nadzan, Alex M.; Pernet, Andre G.; and Hanessian, Stephen, 4,572,907, Cl. 514-25.000.

Abe, Hideki; and Tanaka, Hiroshi, to Dowa Mining Co., Ltd. Method of recovering metals from industrial by-products. 4,572,822, Cl. 423-37.000.

Abe, Masaharu: *See—*
Fushiki, Yasuo; Abe, Masaharu; and Oizumi, Masayuki, 4,572,859, Cl. 428-215.000.

Abe, Miki: *See—*
Suzuki, Tadao; and Abe, Miki, 4,573,039, Cl. 340-347.0DA.

Abe, Ryozo: *See—*
Sugiyama, Hiroyuki; Sakurai, Masaki; Abe, Ryozo; Yusa, Yasuhiro; Yoshihara, Kenji; and Saito, Takashi, 4,573,092, Cl. 360-97.000.

Abe, Takao: *See—*
Nakamura, Masaki; Abe, Takao; Koshizuka, Kunihiro; Kitamura, Shigehiro; Ishii, Fumio; and Hotta, Yuji, 4,572,860, Cl. 428-216.000.

Abe, Tomoaki; Kinugawa, Masumi; and Suzuki, Atsushi, to Nippondenso Co., Ltd. Air flow measuring apparatus. 4,571,991, Cl. 73-118.000.

Abe, Zenwemon; Yamada, Yoshifumi; and Tanaka, Kunio, to Asahikawa Medical College. Method of measuring internal information from a target by using nuclear magnetic resonance. 4,573,015, Cl. 324-309.000.

Abraham, Marvin M.; Boldu, Jose L.; Chen, Yok; and Orera, Victor M., to United States of America, Energy. Method for the preparation of photochromic insulating crystals. 4,572,618, Cl. 350-354.000.

Acela Pump AB: *See—*
Hogfeldt, Carl-Erik, deceased, 4,572,943, Cl. 219-273.000.

Ackeret, Peter, to Licinvest AG. Container for a stack of pictures. 4,571,865, Cl. 40-10.00R.

Acorn Engineering Company: *See—*
Morris, Earl L.; and Hafner, V. Walter, 4,571,901, Cl. 52-106.000.

ACTV Inc.: *See—*
Freeman, Michael J., 4,573,072, Cl. 358-86.000.

Adam, William S.: *See—*
Timme, William F., 4,571,995, Cl. 73-199.000.

Adams, Jerryl, to Bell and Howell Company. Insertion machine with postage categorization. 4,571,925, Cl. 53-502.000.

Adams, Richard J., to Beloit Corporation. Urethane covered paper machine roll. 4,571,798, Cl. 29-121.800.

Adolph Coors Company: *See—*
Jensen, James W.; and Haake, Joseph R., 4,572,752, Cl. 156-64.000.

Adrian March Research Ltd.: *See—*
March, Adrian A. C., 4,572,952, Cl. 250-237.00G.

Aerospace Corporation, The: *See—*
Lewinter, Sidney W., 4,573,188, Cl. 381-46.000.

Aerotron, Inc.: *See—*
Jacobs, Paul H.; and Collette, Douglas P., 4,573,208, Cl. 455-71.000.

Agency of Industrial Science & Technology: *See—*
Sakuragi, Shiro; Saitoh, Mitsunori; Kotani, Haruo; and Imagawa, Kyoshiro, 4,572,609, Cl. 350-96.300.

Agfa-Gevaert Aktiengesellschaft: *See—*
Koepke, Gunther; Frenken, Hans; Bussmann, Heinrich; and Browatzki, Kurt, 4,572,849, Cl. 427-402.000.

Agrownautics, Inc.: *See—*
Drury, Geoffrey, 4,572,251, Cl. 141-1.000.

Ahn, Yu H. Fastening means for a bootlace. 4,571,782, Cl. 24-141.000.

Ahs, Vilgot, to Tocksfors Verkstads AB. Method of manufacturing an elastic and flexible backing. 4,572,755, Cl. 156-166.000.

Aichert, Hans; Kieser, Jorg; and Kukla, Reiner, to Leybold-Heraeus GmbH. Magnetron cathode for sputtering ferromagnetic targets. 4,572,776, Cl. 204-298.000.

Aigner, Philip C.: *See—*
Chesebro, Robert E., Jr.; and Aigner, Philip C., 4,571,959, Cl. 66-169.00R.

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Jaquette, Robert D., 4,572,551, Cl. 285-108.000.

Airpot Corporation: *See—*
Leonard, George H., 4,571,775, Cl. 16-298.000.

Aisin Seiki Kabushiki Kaisha: *See—*
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Aisin-Warner Kabushiki Kaisha: *See—*
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Akagi, Motonobu: *See—*
Inada, Masami; Kawabata, Yasuhiro; and Akagi, Motonobu, 4,571,945, Cl. 60-602.000.

Akahane, Takayuki: *See—*
Lanier, Tyre C.; and Akahane, Takayuki, 4,572,838, Cl. 426-643.000.

Akashi, Akira, to Canon Kabushiki Kaisha. Camera capable of operating in an automatic focus adjusting mode and a manual focus adjusting mode. 4,572,643, Cl. 354-409.000.

Akashi, Shunji, to Yoshida Kogyo K.K. Separable bottom-end-stop assembly for separable slide fastener. 4,571,785, Cl. 24-433.000.

Akers, William: *See—*
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Fidi, Werner; and Richter, Friedrich, 4,572,324, Cl. 181-129.000.

Akiba, Shigeyuki: *See—*
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Akita, Sigeyuki: *See—*
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Akitake, Hiroshi: *See—*
Yoshida, Yoichi; Hashimoto, Akihiko; Suzuki, Tatsuya; Shirai, Hitoshi; Akitake, Hiroshi; and Nakazawa, Hirotsugu, 4,572,645, Cl. 354-435.000.

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Alaria, Gian B.; Destefanis, Paolo; and Poggio, Cesare, to CSELT Centro Studi e Laboratori Telecomunicazioni S.p.A. Coding and decoding method and system for variable-length sequences of digital data. 4,573,074, Cl. 358-136.000.

Albanese, James J., Jr.: *See—*
Pratt, David C.; and Albanese, James J., Jr., 4,572,406, Cl. 222-39.000.

Albers, Martin, to MTU - Motoren-und Turbinen-Munchen GmbH. Apparatus for controlling the flow of leakage and cooling air of a rotor of a multi-stage turbine. 4,571,937, Cl. 60-39.750.

Albert, Michael P. Multi-ply garment component and method of fabrication. 4,571,745, Cl. 2-139.000.

Alciati, Fiorenzo, to Societa' Impianti Elettrici Telefonici Telegrafici e. Costruzioni Edili S.p.A. Shock absorbing support. 4,572,490, Cl. 267-140.100.

Alexander, Herman: *See—*
Langwell, John D., 4,572,380, Cl. 211-57.100.

Alexander, Lloyd E.: *See—*
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Chowdhury, Mofazzal H.; and Ellis, Michael W., 4,572,105, Cl. 119-14.180.

Alfred Honsel Nieten- und Metallwarenfabrik GmbH & Co.: *See—*
Schwab, Manfred F., 4,571,976, Cl. 72-391.000.

Alfred Teves GmbH: *See—*
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Messineo, Leonard E., 4,572,502, Cl. 272-73.000.

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Kessler, Laibe A.; and Walsh, Jean M., 4,571,904, Cl. 52-205.000.

Allen Engineering Corporation: *See—*
Allen, J. Dewayne, 4,572,704, Cl. 404-114.000.

Allen, Gordon H.; and Ray, Kenneth I., to Motorola, Inc. Miller capacitance effect eliminator for use with a push-pull amplifier output stage. 4,572,970, Cl. 307-254.000.

Allen, J. Dewayne, to Allen Engineering Corporation. High density concrete placing and finishing machine. 4,572,704, Cl. 404-114.000.

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Chang, Irving B.; and Beckwith, Robert E., 4,572,874, Cl. 428-523.000.
Euler, Richard W., 4,572,023, Cl. 74-493.000.
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Smith, Roger L.; and Wegh, John R., 4,572,336, Cl. 188-72.600.
Wakeman, Russell J.; Wright, Danny O.; and Peterson, William A., Jr., 4,571,996, Cl. 73-202.000.

Allo, Vincent F.; and Stafford, Donald C., to Chicago Bridge & Iron Company. Falling film heat exchanger with film forming members. 4,572,287, Cl. 165-118.000.

Almen, Torsten: *See—*
Gronberg, Thomas; Almen, Torsten; Golman, Klaes; Mattsson, Soren; and Sjoberg, Staffan, 4,573,181, Cl. 378-45.000.

Alpern, Marvin, to Ethicon, Inc. Suture retainer for multistrand sutures with single strand suture dispensing. 4,572,363, Cl. 206-63.300.

Alpert, Nathaniel M.: *See—*
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Alsch, Gottfried: *See—*
Naimer, Hubert L.; and Alsch, Gottfried, 4,573,029, Cl. 335-122.000.

Altman, Earl M.: *See—*
Holmberg, Arthur, Jr.; and Altman, Earl M., 4,572,488, Cl. 267-8.00R.

Amano, Tadashi; Sato, Yasuaki; and Ohkoshi, Yasuo, to Konisiroku Photo Industry Co., Ltd. Color printer. 4,572,657, Cl. 355-38.000.

Amax Inc.: *See—*
Duyvesteyn, Willem P. C.; and Jha, Mahesh C., 4,572,771, Cl. 204-118.000.
Hepworth, Malcolm T., 4,572,085, Cl. 110-345.000.

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Ament, Charles E.: *See—*
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Mitchell, John; and Ament, Charles E., 4,572,145, Cl. 123-538.000.

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Bluhm, Dieter H.; and Drumm, Volker, 4,572,458, Cl. 242-131.000.

American Cyanamid Company: *See—*
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Lipsky, Stephen E., 4,573,212, Cl. 455-282.000.

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Ammon, J. Preston; Weaver, Harry R.; and Evans, Evan J., to Elfab Corp. Printed circuit board finger connector. 4,572,604, Cl. 339-176.0MP.

Amotz, Shmuel; Rugh, Susanne; Markussen, Erik K.; and Thomsen, Kurt, to Novo Industri A/S. Carrier for immobilizing enzymes. 4,572,897, Cl. 435-177.000.

AMP Incorporated: *See—*
Pegram, Warren J.; and Sergeant, Ronald G., 4,572,248, Cl. 140-92.100.
Rupnik, David W., 4,572,602, Cl. 339-65.000.
Weidler, Charles H., 4,572,603, Cl. 339-97.00R.

Analogic Corporation: *See—*
Dolazza, Enrico, 4,573,035, Cl. 340-347.0AD.

Anderson, Frank E., Jr.: *See—*
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Anderson, James D., to Burndy Corporation. Connector transport station for compact semi-automatic cable assembly system. 4,571,823, Cl. 29-749.000.

Anderson, James M.; Schultz, William R., Jr.; VanSchaick, Thomas E.; and Anderson, Frank E., Jr., to General Electric Company. Stator core for large electric generator with dual dovetail slots for engaging wedges. 4,572,980, Cl. 310-214.000.

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Anorad Corporation: *See—*
Chitayat, Anwar, 4,571,799, Cl. 29-149.50A.

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Rockwood, Robert E.; Antkowiak, Richard P.; and Hill, Douglas J., 4,572,517, Cl. 277-53.000.

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Antonissen, Peter, to Thurne Engineering Company Limited. Method and apparatus for slicing a product in accordance with its anticipated weight distribution. 4,572,044, Cl. 83-42.000.

Anzai, Masayasu: *See—*
Komatsu, Isamu; Anzai, Masayasu; and Hoshi, Nobuyoshi, 4,572,651, Cl. 355-4.000.

Aoki, Akira: *See—*
Suzuyama, Tomio; and Aoki, Akira, 4,571,763, Cl. 5-464.000.

Aoyagi, Yukio; Izumi, Eiki; Tanaka, Sotaro; and Yamaguchi, Takeshi, to Hitachi Construction Machinery Co, Ltd. Hydraulic power system. 4,571,941, Cl. 60-466.000.

Aoyama, Keizo; Yamauchi, Takahiko; and Seki, Teruo, to Fujitsu Limited. Semiconductor memory device. 4,573,147, Cl. 365-230.000.

Aponte, Guillermo. Military board game. 4,572,514, Cl. 273-255.000.

Appleton Papers Inc.: *See—*
Miller, Robert E.; and Vervacke, Steven L., 4,573,063, Cl. 346-216.000.

APV Burnett & Rolfe, Inc.: *See—*
Roach, Henry P.; and Gunn, Jeffrey W., 4,571,920, Cl. 53-300.000.

Aquatech, Inc.: *See—*
Watson, Cedric H., 4,572,783, Cl. 210-109.000.

Aquino, Luis G.: *See—*
Krasuk, Julio; Solari, Rodolfo B.; Aquino, Luis G.; Rodriguez, Jose V.; and Granados, Alejandro, 4,572,781, Cl. 208-309.000.

Arai, Hiroyuki: *See—*
Yamanobe, Ken; Arai, Hiroyuki; and Kasai, Touru, 4,572,997, Cl. 318-349.000.

Arakawa, Kohei, to Nikkiso Co., Ltd. Process for preparing fine carbon fibers in a gaseous phase reaction. 4,572,813, Cl. 264-29.200.

Arakawa, Noriyuki: *See—*
Sakagami, Teruo; and Arakawa, Noriyuki, 4,572,905, Cl. 502-402.000.

Araki, Shuichi: *See—*
Hashiyama, Hideshi; Araki, Shuichi; and Ogura, Michio, 4,573,201, Cl. 382-56.000.

Arato, Michael P., to Penta Construction Corp. Rail fastener assembly. 4,572,431, Cl. 238-283.000.

Arbed S.A.: *See—*
Schleich, Jean-Baptiste; Lahoda, Erwin; Lickes, Jean-Paul; and Reuter, Emile, 4,571,913, Cl. 52-722.000.

Arens, Hans, to Grunbeck Wasseraufbereitung GmbH. Container for chemicals. 4,572,397, Cl. 220-270.000.

Arita, Kishio; Mitani, Susumu; Sakai, Hideo; Sudo, Yoshikazu; Koide, Yoshitaka; Sato, Haruzi; Habuka, Yoshio; Kozakai, Takashi; and Tanaka, Hiroji, to Nippon Telegraph and Telephone Public Corporation; and Mitsubishi Denki Kabushiki Kaisha. Ultrasonic inspecting apparatus. 4,571,999, Cl. 73-598.000.

Armco Inc.: *See—*
Sussman, Richard C.; and Evans, Larry G., 4,572,747, Cl. 148-3.000.

Armstead, George B., Jr., to Merrow Machine Company, The. Handwheel modified for improved lubrication and cooling. 4,572,092, Cl. 112-256.000.

Arndt, Klaus; and Sanvido, Saverio, to Contraves AG. Optical system for a sighting device. 4,572,625, Cl. 350-541.000.

Arnold, Herbert; Hofer, Heinz; and Horbelt, Michael, to Robert Bosch GmbH. Apparatus for controlling the overrun mode of operation of an internal combustion engine. 4,572,126, Cl. 123-325.000.

Arnold, Herbert; Horbelt, Michael; and Dahlke, Gerald, to Robert Bosch GmbH. Arrangement for supplying a maximum quantity of fuel. 4,572,142, Cl. 123-478.000.

Arrow Oil Tools Inc.: *See—*
Clifton, Ted G., 4,572,290, Cl. 166-123.000.

Arrowsmith, John E.: *See—*
Campbell, Simon F.; Cross, Peter E.; Stubbs, John K.; and Arrowsmith, John E., 4,572,908, Cl. 514-340.000.

Asahi Dow Limited: *See—*
Yamazoe, Katsuhiko; Yoshino, Akira; Kitahama, Yoshiharu; and Iwami, Isamu, 4,572,803, Cl. 534-16.000.

Asahikawa Medical College: *See—*
Abe, Zenwemon; Yamada, Yoshifumi; and Tanaka, Kunio, 4,573,015, Cl. 324-309.000.

Asai, Hiraki: *See—*
Ikeda, Noriaki; Kai, Mutsunori; and Asai, Hiraki, 4,572,451, Cl. 242-56.00R.

Asami, Shojiro: *See—*
Obama, Yoshiaki; and Asami, Shojiro, 4,573,093, Cl. 360-97.000.

Asao, Yasuzi, to Fuji Photo Film Co., Ltd. Photographic resin-coated paper. 4,572,893, Cl. 430-532.000.

ASEA Aktiebolag: *See—*
Sundberg, Yngve, 4,572,278, Cl. 164-457.000.

Asenbauer, Donald J. Plastic holding tray for liquid sample tubes. 4,572,371, Cl. 206-443.000.

Ashkenazi, Aryeh. Telescopic projectile and apparatus for firing same. 4,572,463, Cl. 244-3.300.

Ashton, Geoffrey B., to Geoffrey Ashton Pty. Ltd. Sectional screens. 4,571,906, Cl. 52-239.000.

ASQ Boats, Inc.: *See—*
Lee, Steven N., 4,572,101, Cl. 118-500.000.

Asulab S.A.: *See—*
Bui, Ngoc C.; Michel, Jean-Georges; and Monbaron, Jean-Jacques, 4,573,187, Cl. 381-43.000.

AT&T Bell Laboratories: *See—*
Anthony, Philip J.; and Gordon, Eugene I., 4,573,156, Cl. 372-19.000.
Becke, Hans W.; Gammel, John C.; Hartman, Adrian R.; Shibib, Muhammed A.; and Smith, Robert K., 4,573,065, Cl. 357-38.000.
Ganesan, Apparajan; and Morrison, Ronald A., 4,573,099, Cl. 361-56.000.

Ingaglio, Michael L., 4,571,824, Cl. 29-764.000.
Kaminow, Ivan P., 4,573,163, Cl. 372-96.000.
Nash, Randy D., 4,573,205, Cl. 455-30.000.
Robinson, McDonald; Weston, Harry T.; and Wong, Yiu H., 4,571,818, Cl. 29-576.00W.
Schubert, Rudolf, 4,573,030, Cl. 335-156.000.

AT&T Information Systems, Inc.: *See*—
Carbrey, Robert L., 4,573,038, Cl. 340-347.00C.

AT&T Laboratories: *See*—
Shoji, Masakazu, 4,572,972, Cl. 307-303.000.

AT&T Teletype Corporation: *See*—
Jacobs, Norman A., 4,571,826, Cl. 29-840.000.

Atasi Corporation: *See*—
Gibeau, Frank C.; and Farmer, Paul L., 4,573,094, Cl. 360-106.000.

ATEC-Weiss KG: *See*—
Weiss, Hermann; and Weiss, Rudolf, 4,572,342, Cl. 192-56.00R.

Athlone Industries, Inc.: *See*—
Hubbert, David W.; and Robinson, Bobby L., 4,572,507, Cl. 273-60.00R.

Augustine, Douglas J.: *See*—
Augustine, Scott D.; and Augustine, Douglas J., 4,572,188, Cl. 128-380.000.

Augustine, Scott D.; and Augustine, Douglas J. Airflow cover for controlling body temperature. 4,572,188, Cl. 128-380.000.

Auth, Gerry L., to MIDAC Corporation. Apparatus and method for photoluminescent analysis. 4,572,668, Cl. 356-318.000.

Autry Industries, Inc.: *See*—
Lin, Yung-Mao; and Autry, James C., 4,571,856, Cl. 36-89.000.

Autry, James C.: *See*—
Lin, Yung-Mao; and Autry, James C., 4,571,856, Cl. 36-89.000.

Auvray, Gerard: *See*—
Guillerot, Jean C.; Joncour, Hubert; Auvray, Gerard; and Balduzzi, Daniel, 4,573,052, Cl. 343-18.00E.

Azam, Guy; Convert, Guy; Dufour, Jacques; Jasmin, Claude; and Sidi, Joel, to CGR/MEV. Hyperthermia apparatus. 4,572,190, Cl. 128-399.000.

Azegami, Tadashi, to Kabushiki Kaisha Hokushin Denki Seisakusho. Memory circuit for producing analog output. 4,573,142, Cl. 365-45.000.

Baach, Hans: *See*—
Scholz, Erhard; Heimann, Edmund; and Baach, Hans, 4,572,936, Cl. 219-73.200.

Baba, Kiyokazu; and Ikeoka, Nao-aki, to Kabushiki Kaisha Komatsu Seisakusho. Double acting press for sheet metal forming. 4,571,979, Cl. 72-350.000.

Babcock, John W.: *See*—
Benson, Cade L.; and Babcock, John W., 4,572,711, Cl. 405-286.000.

Babson Bros. Co.: *See*—
Rubino, Daniel A., 4,572,104, Cl. 119-14.020.

Bach, Gary, to Coca-Cola Company, The. Method of ultrasonic welding and apparatus therefor. 4,572,753, Cl. 156-73.100.

Baeger, Holm: *See*—
Nickol, Friedrich W.; and Baeger, Holm, 4,572,615, Cl. 350-334.000.

Baer, Carl D. Container for dispersant. 4,572,375, Cl. 206-524.100.

Bago, Julius. High compression ratio and efficiency governed self-ignition internal combustion engine. 4,572,133, Cl. 123-431.000.

Baguena, Michel. Variable valve timing for four-stroke engines. 4,572,118, Cl. 123-90.160.

Bahrani, Abdul S., to Procter & Gamble Company, The. Method and apparatus of manufacturing porous pouches containing granular product. 4,571,924, Cl. 53-453.000.

Bailey, Francis V., to Outboard Marine Corporation. Method and apparatus for dip coating foam patterns. 4,572,850, Cl. 427-430.100.

Bakal, Abraham I., to Gourmeta, Inc. Stabilized edible herb composition and method. 4,572,836, Cl. 426-321.000.

Baker, Richard. Valve stabilizing cradle. 4,572,236, Cl. 137-364.000.

Bakowsky, Lothar; Beyer, Eckhard; Herziger, Gerd; and Loosen, Peter, to Messer Griesheim GmbH. Gas laser, particularly fast axial flow gas transport laser. 4,573,162, Cl. 372-61.000.

Balduzzi, Daniel: *See*—
Guillerot, Jean C.; Joncour, Hubert; Auvray, Gerard; and Balduzzi, Daniel, 4,573,052, Cl. 343-18.00E.

Balent, Russell P.: *See*—
Hunt, James R.; and Balent, Russell P., 4,571,850, Cl. 34-242.000.

Baliga, Bantval J.; and Love, Robert P., to General Electric Company. Method of making vertical channel field controlled device employing a recessed gate structure. 4,571,815, Cl. 29-571.000.

Ballard, Thomas B. Adjustable welding furnace. 4,572,944, Cl. 219-391.000.

Ballas, William E. Fish landing net. 4,571,875, Cl. 43-11.000.

Ban, Masuo, to Shimano Industrial Company Limited. Dragging device for a spinning reel. 4,572,448, Cl. 242-84.50A.

Bangert, Dieter: *See*—
Quitmann, Horst; and Bangert, Dieter, 4,572,395, Cl. 220-203.000.

Barabas, John: *See*—
Castro, Bernard; Barabas, John; and Boccella, Ralph, 4,571,756, Cl. 5-53.00R.

Barber, Leo D.: *See*—
Breakey, Fred B.; Barber, Leo D.; Chapman, Richard L.; Godin, Norman; Henry, Robert; Jackson, Claude; Romberger, John; and Seidl, Rudolph, 4,572,381, Cl. 211-94.000.

Barker, Robert E., Jr.; and Chen, Daniel Y., to United States of America, Air Force. Miniature cell adaptor to accommodate small samples in resistivity cells. 4,573,010, Cl. 324-158.00F.

Barlow, J. Bruce. Drain assembly with synthetic resin lock nut and coupling elements. 4,571,751, Cl. 4-288.000.

Barmag Barmer Maschinenfabrik AG: *See*—
Schwelm, Hans, 4,572,234, Cl. 137-489.000.

Barman, Mohan, to Produits d'Acier Anjou, Inc. Fireproof and soundproof door. 4,571,915, Cl. 52-785.000.

Barnes, Johnny G.: *See*—
Gaudet, James L.; Lineman, Harry L.; Chukran, Rudolph E.; Neuman, Grover H.; and Barnes, Johnny G., 4,573,138, Cl. 364-900.000.

Barnett, Ronald E.: *See*—
Zanno, Paul R.; Barnett, Ronald E.; and Roy, Glenn M., 4,572,799, Cl. 260-112.50R.

Barnickel, Thomas J.: *See*—
Brauer, Paul R.; Barnickel, Thomas J.; and Mast, Gary C., 4,572,009, Cl. 73-864.910.

Barradas, George. Soft roller hair curler and heating arrangement therefor. 4,572,221, Cl. 132-33.00R.

Barretto Garcia, Manuel; and Zapata Oviedo, Aurora, to Consultora Sides C.A. Prefabricated element for use in particular in the building industry and a method of manufacture of said prefabricated element. 4,572,861, Cl. 428-240.000.

Barringer, Jack E. Tug-of-war game. 4,572,511, Cl. 273-1.0GC.

Barry, Daniel T., to University of Michigan, The. Acoustic myography. 4,571,750, Cl. 623-258.000.

Barton, John R.: *See*—
Kusenberger, Felix N.; Barton, John R.; and Ferguson, George A., 4,573,013, Cl. 324-238.000.

Barton, William M., Jr.; Murphy, John F.; Offerman, Karl B.; and Fisher, Richard G., to Cipher Data Products, Inc. Cartridge tape drive. 4,573,091, Cl. 360-93.000.

Bartram, Roger W.: *See*—
Robinson, Stewart W.; Bartram, Roger W.; and Dehuff, John A., 4,572,737, Cl. 75-53.000.

Baruffaldi Frizioni S.p.A.: *See*—
Boffelli, Pier C., 4,572,343, Cl. 192-56.00R.

Basinski, Zbigniew: *See*—
Saimoto, Shigeo; and Basinski, Zbigniew, 4,572,001, Cl. 73-765.000.

Battelle Memorial Institute: *See*—
Harmer, Alan L., 4,572,950, Cl. 250-227.000.

Baughman, George W. Water leak control circuit. 4,572,113, Cl. 122-504.200.

Bauman, Bruce K., to Borg-Warner Corporation. Surge protection system for a d-c power supply during power-up. 4,573,113, Cl. 363-48.000.

Bayer Aktiengesellschaft: *See*—
Berg, Dieter; Reiser, Wolf; and Lurssen, Klaus, 4,572,734, Cl. 71-72.000.
Boden, Heinrich; and Schneider, Walter, 4,572,820, Cl. 422-133.000.
Ebneth, Harold; Fitzky, Hans G.; Wolf, Gerhard D.; and Giesecke, Henning, 4,572,960, Cl. 250-516.100.
Wegner, Christian; Schneider, Gottfried; and Mayer, Wolfram, 4,572,171, Cl. 128-90.000.

Bayerische Motoren Werke Aktiengesellschaft: *See*—
Heyl, Gerrit, 4,572,534, Cl. 280-276.000.

Bean, Lloyd F.; and Miller, Roger L., to Xerox Corporation. Hybrid development system. 4,572,647, Cl. 355-3.00R.

Beaver, R. Neal; Byrd, Carl E.; and Alexander, Lloyd E., to Dow Chemical Company, The. Preparation and use of electrodes in the electrolysis of alkali halides. 4,572,770, Cl. 204-98.000.

Becke, Hans W.; Gammel, John C.; Hartman, Adrian R.; Shibib, Muhammed A.; and Smith, Robert K., to AT&T Bell Laboratories. Radial high voltage switch structure. 4,573,065, Cl. 357-38.000.

Becker, Dietmar: *See*—
Wenz, Herbert; and Becker, Dietmar, 4,572,093, Cl. 112-256.000.

Beckerer, Frank S., Jr.; and Spangler, William F., to Beckerer, Frank S., Jr. Boat window. 4,572,266, Cl. 160-92.000.

Beckett, Donald E. Packaging structure. 4,572,377, Cl. 206-610.000.

Beckwith, Robert E.: *See*—
Chang, Irving B.; and Beckwith, Robert E., 4,572,874, Cl. 428-523.000.

Bedell, Edward L., to Corcliff Corporation. Fluid-cooled metallurgical tuyere. 4,572,482, Cl. 266-47.000.

Bednar, Gregory M.; Fitzpatrick, Brian E.; Harmon, John C.; and Narasimha, Manthri S. I., to International Business Machines Corporation. Video normalization for hand print recognition. 4,573,200, Cl. 382-47.000.

Bekaert, Marc, to N.V. Maatschappij Voor Studie, Bijstand en Onderzoek "M.S.B.O.". Insulating board of composite material. 4,572,857, Cl. 428-117.000.

Beldavs, Vitauts, to RCA Corporation. Printed circuit board assembly and method for the manufacture thereof. 4,573,105, Cl. 361-403.000.

Bell, Frank H., to Morton Thiokol, Inc. Cased cartridge ammunition ignition booster. 4,572,078, Cl. 102-464.000.

Bell and Howell Company: *See*—
Adams, Jerryl, 4,571,925, Cl. 53-502.000.

Bell & Howell Company GmbH: *See*—
Dreschel, Jurgen; Mobs, Heinrich; and Hog, Peter, 4,572,497, Cl. 270-58.000.

Bellman, Robert H.; Borrelli, Nicholas F.; Morse, David L.; and Sachenik, Paul A., to Corning Glass Works. Apparatus including an integral optical device. 4,572,611, Cl. 350-167.000.

Beloit Corporation: *See*—
Adams, Richard J., 4,571,798, Cl. 29-121.800.

Beltran Leyva, Benedo: *See*—
Herrera Giammattei, Octavio; Veramontes Brown, Federico; Beltran Leyva, Benedo; and Cervantes Patino, Damian, 4,572,068, Cl. 101-35.000.

Ben Clements & Sons, Inc.: *See*—
Furutsu, Akira, 4,571,787, Cl. 24-543.000.

Benaroya, Rafael. Timed dispensing device for tablets, capsules, and the like. 4,572,403, Cl. 221-3.000.

Bendiberica, S.A.: *See*—
Anguera, Narciso M., 4,572,314, Cl. 180-79.100.

Benko, John C. Safety platform. 4,572,328, Cl. 182-1.000.

Benoit, Pierre, to Promogap. Apparatus for measuring the refractive index of an optical fiber. 4,572,665, Cl. 356-73.100.

Benson, Cade L.; and Babcock, John W., to Stresswall International, Inc. Prestressed component retaining wall system. 4,572,711, Cl. 405-286.000.

Benson, David K.; Burrows, Richard W.; and Shinton, Yvonne D., to United States of America, Energy. Composite materials for thermal energy storage. 4,572,864, Cl. 428-305.500.

Benzing, David W., to Benzing Technology, Inc. Troide plasma reactor with magnetic enhancement. 4,572,759, Cl. 156-345.000.

Benzing Technology, Inc.: *See*—
Benzing, David W., 4,572,759, Cl. 156-345.000.

Berg, Dieter; Reiser, Wolf; and Lurssen, Klaus, to Bayer Aktiengesellschaft. Plant growth-regulating agents. 4,572,734, Cl. 71-72.000.

Bergamaschi, Athos. Machine for manufacturing folding shaving razors. 4,571,797, Cl. 29-33.00K.

Berger, Johann; and Berger, Josef. Clamping device. 4,571,961, Cl. 66-208.000.

Berger, Josef: *See*—
Berger, Johann; and Berger, Josef, 4,571,961, Cl. 66-208.000.

Berghuis, Thomas G.; and Propson, James A., to Keller Structures, Inc., a part interest. Insulated building and method of manufacturing same. 4,571,909, Cl. 52-309.800.

Bergler, Otto, to Black & Decker Overseas AG. Planing tool and cutter therefor. 4,572,259, Cl. 144-230.000.

Bergmans, Christianus H. J.: *See*—
Valkestijn, Leonardus A. A.; and Bergmans, Christianus H. J., 4,572,994, Cl. 315-411.000.

Bergwerksverband GmbH: *See*—
Ward, Derek E., 4,572,723, Cl. 55-25.000.

Bernard, Jean; Beyl, Jean; le Faou, Daniel; Peyre, Henri; and Viodet, Patrice, to Ste LOOK. Safety toe-abutment member for a ski. 4,572,541, Cl. 280-628.000.

Berry, Robert L., to Fairchild Camera & Instrument Corporation. Method of fabricating integrated circuit structures using replica patterning. 4,572,765, Cl. 156-643.000.

Berry, Ronald B.: *See*—
Hubbard, James R.; and Berry, Ronald B., 4,573,060, Cl. 346-140.00A.

Bertrams, Josef, to W. Schlafhorst & Co. Device for the dosage and injection of a small quantity of liquid into the splicing air of a pneumatic yarn splicing device. 4,571,929, Cl. 57-22.000.

Besemann, Alfred, to E. C. H. Will GmbH & Co. Apparatus for diverting stacks of sheets in paper processing machines. 4,572,350, Cl. 198-372.000.

Best Lock Corporation: *See*—
Foshee, William R., 4,572,556, Cl. 292-165.000.

Bette, Willi: *See*—
Cirkel, Hans-Jurgen; Bette, Willi; and Muller, Reinhard, 4,573,160, Cl. 372-38.000.

Beyer, Eckhard: *See*—
Bakowsky, Lothar; Beyer, Eckhard; Herziger, Gerd; and Loosen, Peter, 4,573,162, Cl. 372-61.000.

Beyl, Jean: *See*—
Bernard, Jean; Beyl, Jean; le Faou, Daniel; Peyre, Henri; and Viodet, Patrice, 4,572,541, Cl. 280-628.000.

Bhandari, Baldev: *See*—
Lamarche, Raymond B.; Bhandari, Baldev; Desaultels, Remi; and Drolet, Pierre, 4,571,852, Cl. 36-32.00R.

Bianchi, Julio J., to General Electric Company. Reset mechanism. 4,572,945, Cl. 235-144.0SP.

Bianco, Carlo, to Fameccanica S.p.A. Method and apparatus for forming elastic elements under tension from a continuous elastic web, particularly for manufacturing sanitary products such as disposable diapers and the like. 4,572,043, Cl. 83-18.000.

Bick, Hal W. Sanitary device system. 4,571,752, Cl. 4-300.000.

Bieri, Hans, to Hydrostress AG. Mobile concrete or rock cutting apparatus. 4,572,580, Cl. 299-1.000.

Biermans, Andreas J.; Burks, Henk C.; and Raemaekers, Karel G. H., to Unie van Kunstmestfabrieken B.V. Method and apparatus for determining the saturation temperature of a solution. 4,572,676, Cl. 374-17.000.

Biermans, Andreas J.; and Burks, Henk C., to Unie van Kunstmestfabrieken B.V. Process for determining and controlling the composition of aqueous solutions of NH_3 and CO_2 . 4,572,830, Cl. 423-659.000.

Bijttebier, Gaspar A. H.; and Vangheluwe, Jozef, to Bijttebier, Gaspar A. H. Process and apparatus for registering sheets. 4,572,499, Cl. 271-251.000.

Binsfeld, Adrien, to Goodyear Tire & Rubber Company, The. Pneumatic tire tread. 4,572,261, Cl. 152-209.00R.

Bio Mabuchi Co. Ltd.: *See*—
Mabuchi, Kenichi, 4,572,166, Cl. 128-52.000.

Bioglan, Inc.: *See*—
Crooks, Michael J., 4,572,915, Cl. 514-458.000.

Bioglan Laboratories: *See*—
Crooks, Michael J., 4,572,915, Cl. 514-458.000.

Biorem, Inc.: *See*—
Sagalowsky, Ronald L., 4,572,211, Cl. 128-774.000.

Biotest-Serum-Institut GmbH: *See*—
Walker, Wolfram H.; and Ganshirt, Karlheinz, 4,572,899, Cl. 436-18.000.

Bird, John S.: *See*—
Freckleton, Howard O.; and Bird, John S., 4,571,863, Cl. 38-86.000.

Birritella, Mark S.; and McLaughlin, Kevin, to Motorola, Inc. Method of making closely spaced contacts to PN-junction using stacked polysilicon layers, differential etching and ion implantations. 4,571,817, Cl. 29-576.00B.

Bishop, Arthur E.; Roeske, Klaus J.; and Scott, David W. Apparatus for making steering rack bars. 4,571,982, Cl. 72-400.000.

Bisson, Donald K.; and Nardin, Steven A., to General Electric Company. Method and apparatus for measuring core loss of a laminated ferromagnetic structure. 4,573,012, Cl. 324-222.000.

Black & Decker Overseas AG: *See*—
Bergler, Otto, 4,572,259, Cl. 144-230.000.

Black, Gary: *See*—
Sosnowski, Joseph A.; Black, Gary; and Pritchard, Robert J., 4,572,053, Cl. 89-1.510.

Blackstone Corporation: *See*—
Stohl, Clark E.; and DeCastro, Eugene, 4,572,184, Cl. 128-328.000.

Blackwelders: *See*—
Seiferling, James E., 4,573,124, Cl. 364-424.000.

Blaison, Serge: *See*—
Gombert, Jean; Blaison, Serge; Quinty, Christian; and Gazard, Maryse, 4,572,840, Cl. 427-36.000.

Blanc, Roger, to Salomon S.A. Integrated closure system for a ski boot. 4,571,855, Cl. 36-50.000.

Blatt, Howell L., to Ziamatic Corporation. Smoke ejector carrier. 4,572,414, Cl. 224-212.000.

Blazek, William S., to TRW Inc. Apparatus for use in casting an article. 4,572,275, Cl. 164-339.000.

Blecha, Michael: *See*—
Pollak, Werner; Blecha, Michael; and Specht, Gerhard, 4,572,848, Cl. 427-294.000.

Blikken, Marguerite A.: *See*—
Blikken, Wendell A.; and Blikken, Marguerite A., 4,572,160, Cl. 126-439.000.

Blikken, Wendell A.; and Blikken, Marguerite A. Heliotropic solar heat collector system. 4,572,160, Cl. 126-439.000.

Bloom, Terry R., to CTX Corporation. Method of making an electrical insulative substrate. 4,572,754, Cl. 156-89.000.

Bluhm, Dieter H.; and Drumm, Volker, to American Barmag Corporation. Compact creel for large diameter yarn supply packages. 4,572,458, Cl. 242-131.000.

BOC Group, Inc., The: *See*—
Robinson, Stewart W.; Bartram, Roger W.; and Dehuff, John A., 4,572,737, Cl. 75-53.000.

Boccella, Ralph: *See*—
Castro, Bernard; Barabas, John; and Boccella, Ralph, 4,571,756, Cl. 5-53.00R.

Bock, Erik. Plastic container having inwardly formed flange. 4,572,399, Cl. 220-307.000.

Boden, Heinrich; and Schneider, Walter, to Bayer Aktiengesellschaft. Process and apparatus for the production of a flowable reaction mixture. 4,572,820, Cl. 422-133.000.

Bodier, Jacques; Cochard, Pierre; Merlier, Christian; and Bouquin, Edouard P., to Societe Anonyme dite: PRESTINOX. Composite apparatus for the direct projection and overhead or backprojection of slides. 4,572,632, Cl. 353-71.000.

Boehringer Ingelheim KG: *See*—
Kretzschmann, Gunther; Scholz, Dieter; and Hilgert, Karl-Heinz, 4,572,740, Cl. 106-122.000.

Boehringer, John R.; and Williams, C. Harrison, to Boehringer Laboratories. Dynamic braked spirometer. 4,572,209, Cl. 128-726.000.

Boehringer Laboratories: *See*—
Boehringer, John R.; and Williams, C. Harrison, 4,572,209, Cl. 128-726.000.

Boffelli, Pier C., to Baruffaldi Frizioni S.p.A. Electromagnetic friction clutch. 4,572,343, Cl. 192-56.00R.

Bohnes, Karlheinz: *See*—
Heintzmann, Peter; Koppers, Manfred; Amling, Friedel; and Bohnes, Karlheinz, 4,572,480, Cl. 254-93.00R.

Boldu, Jose L.: *See*—
Abraham, Marvin M.; Boldu, Jose L.; Chen, Yok; and Orera, Victor M., 4,572,618, Cl. 350-354.000.

Bolger, Thomas V., to RCA Corporation. Digital signal coring apparatus with controllable coring threshold level. 4,573,075, Cl. 358-167.000.

Boliden Aktiebolag: *See*—
Sagefors, Ivar K., 4,572,707, Cl. 405-55.000.

Bolingen, Johann: *See*—
Krutz, Ferdinand; Keck, Jurgen; Bolingen, Johann; and Wetzler, Herbert, 4,571,848, Cl. 33-544.000.

Bone, John M. Expansion joint. 4,572,702, Cl. 404-65.000.

Boney, Joel F., to Motorola, Inc. Method and apparatus in a data processor for selectively disabling a power-down instruction. 4,573,117, Cl. 364-200.000.

Bonivich, Paul E., to General Electric Company. System for position sensing transducers. 4,573,139, Cl. 364-900.000.

Booth, Rodney: *See*—
France, Michael; and Booth, Rodney, 4,572,312, Cl. 180-69.210.

Boothman, David R.; and Forde, John C., to Canadian General Electric Co. Ltd. Thermal model for electrical apparatus. 4,573,132, Cl. 364-557.000.

Bopp, Peter, to G. Bopp & Co. AG. Apparatus for tensioning rectangular pieces of fabric. 4,571,864, Cl. 38-102.500.

Bordignon, Abramo, to A.T.B. S.p.A. Magnetic tape backing leaf spring assembly particularly for compact cassettes. 4,573,095, Cl. 360-130.310.

Borg-Warner Corporation: *See—*
Bauman, Bruce K., 4,573,113, Cl. 363-48.000.

Borger, William U., to United States of America, Air Force. Constant speed drive with compensation using differential gears. 4,572,961, Cl. 290-4.00R.

Borrelli, Nicholas F.: *See—*
Bellman, Robert H.; Borrelli, Nicholas F.; Morse, David L.; and Sachenik, Paul A., 4,572,611, Cl. 350-167.000.

Bothwell, Peter W. Carburettor. 4,572,809, Cl. 261-44.00A.

Botos, Ernest D., to Union Carbide Corporation. Hermetic seal for an electrochemical cell. 4,572,877, Cl. 429-53.000.

Botts, Thomas E.; Powell, James R.; and Lenard, Roger, to United States of America, Energy. Magnetically focused liquid drop radiator. 4,572,285, Cl. 165-104.280.

Boudault, Robert, to 501 Telecommunications Radioelectriques et Telephoniques T.R.T. Transmission circuit for modems employing frequency shift keying. 4,573,165, Cl. 375-9.000.

Bouko, Jean; Durand, Jean-Claude; Le Foll, Jean; and Salvat, Francois, to Thomson-CSF. Excitation device for a dual band ultra-high frequency corrugated source of revolution. 4,573,054, Cl. 343-786.000.

Bouligny Company, The: *See—*
Okada, Tokio; Kojima, Shigezo; and Tani, Haruhisa, 4,571,765, Cl. 8-149.300.

Bouquin, Edouard P.: *See—*
Bodier, Jacques; Cochard, Pierre; Merlier, Christian; and Bouquin, Edouard P., 4,572,632, Cl. 353-71.000.

Bourgeois, Leverence, Jr., to Ivy J. Foret Associates, Inc. Adjustable spreader-grader. 4,572,301, Cl. 172-445.100.

Bourse Trading Company, Ltd.: *See—*
Obeck, Carl J., 4,573,049, Cl. 340-924.000.

Bowen, John E., to Condensing Boilers Limited. Heating apparatus. 4,572,111, Cl. 122-17.000.

Bowers, Derek F., to Precision Monolithics, Inc. Analog multiplier with improved linearity. 4,572,975, Cl. 307-498.000.

Bowers, John E.; and Kino, Gordon S., to Leland Stanford Junior University, The Board of Trustees of the. Fiber optic sensor for detecting very small displacements of a surface. 4,572,949, Cl. 250-227.000.

Boyd, Robert C.; and La Patra, Charles L., to Sensormatic Electronics Corporation. Electronic article surveillance security system. 4,573,042, Cl. 340-539.000.

Braasch, Gerd. Rotary grinding tool. 4,571,893, Cl. 51-397.000.

Braaten, Melvin. Water purifier unit. 4,572,785, Cl. 210-181.000.

Brach, Ulrich; and Wiesinger, Wilhelm, to Zeller Plastik Koehn, Graebner & Co. Container made of plastic which can be elastically deformed. 4,572,412, Cl. 222-527.000.

Brandt, Siegard: *See—*
Gustmann, Kurt; Brandt, Siegard; and Sourisseaux, Ludwig, 4,572,091, Cl. 112-229.000.

Brannan, J. Phillip. Fertilizer injection apparatus. 4,572,087, Cl. 111-56.000.

Bratzler, William R. Trailer hitch lock. 4,571,964, Cl. 70-58.000.

Brauer, Paul R.; Barnickel, Thomas J.; and Mast, Gary C., to Temco, Inc. Connector for core holder. 4,572,009, Cl. 73-864.910.

Breakey, Fred B.; Barber, Leo D.; Chapman, Richard L.; Godin, Norman; Henry, Robert; Jackson, Claude; Romberger, John; and Seidl, Rudolph. Bracket board. 4,572,381, Cl. 211-94.000.

Bridgestone Corporation: *See—*
Ogawa, Masaki; Hirata, Yasushi; and Tsuchikura, Akira, 4,572,263, Cl. 152-537.000.

Bridgestone Tire Company Limited: *See—*
Fujita, Mamoru; and Kameta, Yasuaki, 4,572,359, Cl. 198-819.000.
Umezawa, Yujiro; Sano, Shigehisa; and Ogino, Takao, 4,572,264, Cl. 152-451.000.

Briggs, Michael, to Helmets Limited. Helmet with visor mechanism. 4,571,747, Cl. 2-424.000.

Brill, Jurgen, to Schaudt Maschinenbau GmbH. Method of dressing grinding wheels in grinding machines. 4,571,892, Cl. 51-325.000.

Bristol-Myers Company: *See—*
Konishi, Masataka; Sugawara, Koko; Miyaki, Takeo; and Kawaguchi, Hiroshi, 4,572,895, Cl. 435-75.000.

Britax (Wingard) Limited: *See—*
Cunningham, Douglas J.; Else, Robert F.; and Harries, David A., 4,572,544, Cl. 280-808.000.

British Food Manufacturing Industries Research Association, The: *See—*
Poole, Stephen; West, Stuart I.; and Walters, Clifford L., 4,572,837, Cl. 426-564.000.

British Steel Corporation: *See—*
Porter, Malcolm; and Dodgson, Robert, 4,572,673, Cl. 366-127.000.

Brodard, Eric; Duguet, Jean-Pierre; Mallevialle, Joel; and Roustan, Michel, to Societe Lyonnaise des Eaux et de l'Eclairage. Apparatus for dissolving ozone in a fluid. 4,572,821, Cl. 422-186.120.

Bronicki, Lucien Y., to Solmat Systems Ltd. Method of and apparatus for treating the water in a solar pond power plant. 4,571,947, Cl. 60-641.800.

Brooks, Ralf M., to NCR Canada Ltd - NCR Canada LTEE. Closed loop thermal printer for maintaining constant printing energy. 4,573,058, Cl. 346-76.0PH.

Brooks, Robert E., to TRW Inc. Position indicator employing light guides. 4,572,948, Cl. 250-227.000.

Brother Kogyo Kabushiki Kaisha: *See—*
Hirata, Yoshikatsu, 4,572,418, Cl. 226-74.000.

Browatzki, Kurt: *See—*
Koepke, Gunther; Frenken, Hans; Bussmann, Heinrich; and Browatzki, Kurt, 4,572,849, Cl. 427-402.000.

Brown, Eugene N.: *See—*
Dunlap, David R.; and Brown, Eugene N., 4,571,911, Cl. 52-509.000.

Brown, Trevor J., to General Motors Corporation. Plastic wheel cover retention arrangement. 4,572,584, Cl. 301-37.0TP.

Bruengger, Craig V., to Hazeltine Corporation. Double action pressure release. 4,571,788, Cl. 24-602.000.

Bruer, Manfred. Formwork element of brick size. 4,571,908, Cl. 52-309.400.

Brunet, Michel, to Etablissements Valois. Safety actuator for an aerosol valve. 4,572,410, Cl. 222-402.110.

Brunner, Michael G.: *See—*
Calhoun, Gregory L.; Brunner, Michael G.; and Fields, Kevin L., 4,571,802, Cl. 29-157.30R.

Bruno, Robert H.; Johns, Robert G.; Kipperman, Stuart; Mayer, Geoffrey R.; Protzmann, Donald E.; and Uhl, Robert F., to Chesebrough-Pond's Inc. Probe cover holding and dispensing arrangement for electronic thermometer. 4,572,365, Cl. 206-306.000.

Brunswick, Sumner. Orthopedic device and process. 4,572,167, Cl. 128-78.000.

Buchalter, Michael S.; Hopwood, Francis W.; and Haynes, James T., to United States of America, Air Force. Bulk acoustic resonator tracking filter. 4,573,027, Cl. 333-17.00R.

Buchalter, Neal S.; Mannella, Henry E.; and Burkett, Robert A., to Xerox Corporation. Message que interactive control console. 4,572,656, Cl. 355-24.000.

Buchanan, Robert M.: *See—*
Wrighton, Mark S.; Buchanan, Robert M.; and Calabrese, Gary S., 4,572,774, Cl. 204-238.000.

Buckhorn Material Handling Group, Inc.: *See—*
Miller, Daniel R.; and McGlasson, Albert J., 4,572,368, Cl. 206-328.000.

Bui, Ngoc C.; Michel, Jean-Georges; and Monbaron, Jean-Jacques, to Asulab S.A. Speech-controlled electronic apparatus. 4,573,187, Cl. 381-43.000.

Bui, Uyen D.: *See—*
Rochat, Daniel F.; Ogawa, Chuck C.; and Bui, Uyen D., 4,573,011, Cl. 324-158.00F.

Bullis, F. Barton; and Pokorski, John T., to Wheelabrator-Frye, Inc. Mechanism for indexing work seal plates. 4,571,894, Cl. 51-426.000.

Burchett, Roger C.: *See—*
Sutera, Richard; Burchett, Roger C.; and Dukes, Janet L., 4,573,057, Cl. 346-1.100.

Burke, Thomas E. One-shot expandable camera. 4,572,633, Cl. 354-82.000.

Burke, Tim: *See—*
Smith, Paul F.; Schorman, Eric; Burke, Tim; and Lynk, Chuck, 4,573,207, Cl. 455-54.000.

Burkett, Robert A.: *See—*
Buchalter, Neal S.; Mannella, Henry E.; and Burkett, Robert A., 4,572,656, Cl. 355-24.000.

Burks, Henk C.: *See—*
Biermans, Andreas J.; Burks, Henk C.; and Raemaekers, Karel G. H., 4,572,676, Cl. 374-17.000.
Biermans, Andreas J.; and Burks, Henk C., 4,572,830, Cl. 423-659.000.

Burlington Industries, Inc.: *See—*
Sutera, Richard; Burchett, Roger C.; and Dukes, Janet L., 4,573,057, Cl. 346-1.100.

Burndy Corporation: *See—*
Anderson, James D., 4,571,823, Cl. 29-749.000.

Burr-Brown Corporation: *See—*
Wolfson, Sumner H., 4,571,921, Cl. 53-373.000.

Burroughs Wellcome Co.: *See—*
Copp, Frederick C.; Caldwell, Albert G.; and Collard, David, 4,572,913, Cl. 514-403.000.

Burrows, Richard W.: *See—*
Benson, David K.; Burrows, Richard W.; and Shinton, Yvonne D., 4,572,864, Cl. 428-305.500.

Burton, Barrie C., to System E Controls Limited. Bore gauges. 4,571,839, Cl. 33-178.00E.

Burton, R. Edward. Brush bundling system. 4,572,064, Cl. 100-8.000.

Burzan, Vernon J.: *See—*
Hines, Gordon E.; Henke, Arthur W.; and Burzan, Vernon J., 4,571,807, Cl. 29-252.000.

Busch, Gerhard. Horizontal automatic punching machine having a gripping/lifting attachment and a transfer station. 4,572,045, Cl. 83-97.000.

Bushnell, John J.: *See—*
Williams, Derrick G.; Thurlow, John; and Bushnell, John J., 4,572,080, Cl. 104-252.000.

Bussmann, Heinrich: *See—*
Koepke, Gunther; Frenken, Hans; Bussmann, Heinrich; and Browatzki, Kurt, 4,572,849, Cl. 427-402.000.

Butin, Henri: *See—*
Deman, Pierre; and Butin, Henri, 4,573,209, Cl. 455-73.000.

Butler Manufacturing Company: *See—*
Korff, William W., 4,573,127, Cl. 364-493.000.
Byrd, Carl E.: *See—*
Beaver, R. Neal; Byrd, Carl E.; and Alexander, Lloyd E., 4,572,770, Cl. 204-98.000.
C. Reichert Optische Werke, AG: *See—*
Schindl, Klaus, 4,572,624, Cl. 350-502.000.
Cady, John B., to Jaguar Cars Limited. Four-wheel drive vehicle transmission system. 4,572,318, Cl. 180-248.000.
Caffaro S.p.A.: *See—*
Ghielmetti, Giuseppe; Casale, Liborio; and Donelli, Giordano, 4,572,806, Cl. 260-465.00G.
Calabrese, Gary S.: *See—*
Wrighton, Mark S.; Buchanan, Robert M.; and Calabrese, Gary S., 4,572,774, Cl. 204-238.000.
Caldwell, Albert G.: *See—*
Copp, Frederick C.; Caldwell, Albert G.; and Collard, David, 4,572,913, Cl. 514-403.000.
Caldwell Manufacturing Company: *See—*
Haltof, Garry P., 4,571,887, Cl. 49-429.000.
Calhoun, Gregory L.; Brunner, Michael G.; and Fields, Kevin L. Double grip, relative motion tube puller. 4,571,802, Cl. 29-157.30R.
Callahan, James J.: *See—*
Powell, John H.; and Callahan, James J., 4,572,331, Cl. 184-7.400.
Callahan, Mitchell A.: *See—*
Ellis, Laura; Caram, Joe M.; Cantu, John R.; Dudley, Troy W.; and Callahan, Mitchell A., 4,572,533, Cl. 280-242.0WC.
Cameron, Andrew M.: *See—*
Warren, Geoffrey F.; and Cameron, Andrew M., 4,572,736, Cl. 75-10.00R.
Cameron, Donald C.; Cobb, Homer V.; and Winn, Fred M., to Dowell Schlumberger Incorporated. Packing assembly for use in a plunger bore. 4,572,519, Cl. 277-124.000.
Cameron Iron Works, Inc.: *See—*
Grazioli, Angel J., 4,572,515, Cl. 277-12.000.
Sidwell, Derek, 4,572,549, Cl. 285-39.000.
Campbell, Michael E., to General Electric Company. Tool pre-gauging device. 4,571,841, Cl. 33-185.00R.
Campbell, Simon F.; Cross, Peter E.; Stubbs, John K.; and Arrowsmith, John E., to Pfizer Inc. Dihydropyridines. 4,572,908, Cl. 514-340.000.
Campbell, Simon F.; Cross, Peter E.; and Stubbs, John K., to Pfizer Inc. 2-(Secondary aminoalkoxymethyl) dihydropyridine derivatives as anti-ischaemic and antihypertensive agents. 4,572,909, Cl. 514-356.000.
Canada, Her Majesty the Queen in right of, as represented by the Minister of National Defence: *See—*
Mauchlen, Donald B., 4,572,011, Cl. 74-3.500.
Canada, Her Majesty the Queen in right of, as represented by the Minister of National Defence of Her Majesty's Canadian Government: *See—*
Sparkes, Brian G.; and Murray, Douglas G., 4,572,906, Cl. 514-21.000.
Canadian General Electric Co. Ltd.: *See—*
Boothman, David R.; and Forde, John C., 4,573,132, Cl. 364-557.000.
VanDuyn, Martin, 4,572,978, Cl. 310-51.000.
Canon Kabushiki Kaisha: *See—*
Akashi, Akira, 4,572,643, Cl. 354-409.000.
Fujii, Haruo; Sakemi, Yuji; and Toyono, Tsutomu, 4,573,061, Cl. 346-153.100.
Harigaya, Isao; and Tamamura, Hideo, 4,572,640, Cl. 354-400.000.
Haruta, Masahiro; and Hamamoto, Takashi, 4,572,847, Cl. 427-261.000.
Kataoka, Hiroyuki; Yamada, Masanori; and Suzuki, Nobuyuki, 4,572,644, Cl. 354-415.000.
Konno, Tatsuo, 4,572,636, Cl. 354-173.110.
Madate, Haruhisa; Matsumura, Isao; and Sekiguchi, Kyoji, 4,572,627, Cl. 351-206.000.
Maeda, Masaya; Hirata, Noritsugu; and Takimoto, Hiroyuki, 4,573,089, Cl. 360-77.000.
Masaki, Yuichi; and Ogura, Makoto, 4,572,617, Cl. 350-339.00R.
Nishio, Motomitsu, 4,571,835, Cl. 33-20.100.
Omata, Takashi, 4,572,659, Cl. 355-67.000.
Saitoh, Keishi; Ohnuki, Yukihiko; and Ohno, Shigeru, 4,572,882, Cl. 430-57.000.
Shimizu, Katsuichi, 4,573,083, Cl. 358-257.000.
Shimizu, Masami; and Suzuki, Nobuyuki, 4,572,646, Cl. 354-475.000.
Tezuka, Nobuo; and Ogura, Tokihiko, 4,573,087, Cl. 360-60.000.
Toriumi, Mototada; and Kanemitsu, Shinji, 4,572,648, Cl. 355-3.0FU.
Yamamoto, Hiroshi; and Ichiyanagi, Toshikazu, 4,572,642, Cl. 354-402.000.
Cantu, John R.: *See—*
Ellis, Laura; Caram, Joe M.; Cantu, John R.; Dudley, Troy W.; and Callahan, Mitchell A., 4,572,533, Cl. 280-242.0WC.
Capen, John M. Stand for trees, standards and the like. 4,571,882, Cl. 47-40.500.
Cappel, Bert; and Kreuzer, Norbert, to M.A.N.-Roland Druckmaschinen Aktiengesellschaft. Device for guiding sheets printed on one or both sides. 4,572,071, Cl. 101-183.000.
Captor Holding B.V.: *See—*
Heuker of Hoek, Johannes G. J.; Clement, Cornelis J.; and van der Lee, Ernst M., 4,573,043, Cl. 340-571.000.
Caracteres S.A.: *See—*
Moulin, Blaise, 4,572,070, Cl. 101-93.050.
Carago, Frank: *See—*
Sanborn, Harold C.; Carago, Frank; and Kreeger, John R., 4,571,983, Cl. 72-462.000.
Caram, Joe M.: *See—*
Ellis, Laura; Caram, Joe M.; Cantu, John R.; Dudley, Troy W.; and Callahan, Mitchell A., 4,572,533, Cl. 280-242.0WC.
Carbrey, Robert L., to AT&T Information Systems, Inc. Linear codec with dual divider. 4,573,038, Cl. 340-347.00C.
Carl Edelmann Verpackungstechnik GmbH: *See—*
Heuberger, Erich; Knorrich, Wolf-Dieter; and Ehrhart, Karl-Josef, 4,572,422, Cl. 229-7.00R.
Carl Schenck AG, Firma: *See—*
Giesecke, Peter; and Feith, Johann, 4,572,308, Cl. 177-1.000.
Carlqvist, Bengt R., to Telefonaktiebolaget L M Ericsson. PLL having two-frequency VCO. 4,573,024, Cl. 331-1.00A.
Carmack, Paul D.: *See—*
Rabinovich, Evsey, 4,572,255, Cl. 141-217.000.
Caron, Ronald L., to Valley Engineering, Inc. Power hitch. 4,572,315, Cl. 180-134.000.
Carre, Jean-Jacques; and Meyer, Yves, to Societe Anonyme D.B.A. Servomotor for assisted braking. 4,571,942, Cl. 60-547.100.
Carroll, John E.; and McNeal, Joseph R., to Scott USA Limited Partnership. Frameless goggle and method of making the same. 4,571,748, Cl. 2-436.000.
Carson, John R.; and Maryanoff, Bruce E., to McNeilab, Inc. Hexahydroindolinzine compounds, pharmaceutical compositions and methods and intermediates. 4,572,911, Cl. 514-291.000.
Carson, Ralph. Apparatus for storing, carrying and shaking down a clinical thermometer. 4,572,366, Cl. 206-306.000.
Caruso, Louis F. Combined refrigerator and water filtration unit. 4,571,953, Cl. 62-339.000.
Casale, Liborio: *See—*
Ghielmetti, Giuseppe; Casale, Liborio; and Donelli, Giordano, 4,572,806, Cl. 260-465.00G.
Case Communications Inc.: *See—*
Cressey, John R.; and Miller, Stephen A., 4,573,175, Cl. 377-44.000.
Case Poclain Corporation Ltd.: *See—*
France, Michael; and Booth, Rodney, 4,572,312, Cl. 180-69.210.
Casper, Mark S.; and Thomson, Robert I., to Moore Business Forms, Inc. Trim rewinder with automatic stop. 4,572,496, Cl. 270-52.500.
Castellani, Norman; and Holland, Anthony, to Raceway Components, Inc. Press-fittable cable-passage enabling device. 4,572,923, Cl. 174-48.000.
Castellanos, Rigoberto. Plastic foot support with reinforcing struts. 4,571,857, Cl. 36-91.000.
Castiglia, Helen: *See—*
Castiglia, Robert; and Castiglia, Helen, 4,573,108, Cl. 362-123.000.
Castiglia, Robert; and Castiglia, Helen. Decorative lighting system. 4,573,108, Cl. 362-123.000.
Castro, Bernard; Barabas, John; and Boccella, Ralph. Foldaway headrest for convertible furniture. 4,571,756, Cl. 5-53.00R.
Caterpillar Tractor Co.: *See—*
Kemper, Yves J., 4,572,015, Cl. 74-191.000.
Cazes, Roland: *See—*
Sciaky, Mario; Cazes, Roland; and Sayegh, Georges, 4,572,941, Cl. 219-121.0LD.
Cedenblad, Bjorn; and Alexandersson, Hans. Package for coiled products and method of production thereof. 4,572,370, Cl. 206-398.000.
Celotex Corporation, The: *See—*
Gluck, David G.; DeLeon, Alberto; and Oliver, John P., 4,572,865, Cl. 428-309.900.
Centronics Data Computer Corp.: *See—*
Dorr, Steve, 4,572,679, Cl. 400-17.000.
Ceresko, Joseph P., to Space Age Plastic Inc. Tufted upholstery for casket panels and a method of making the same. 4,571,791, Cl. 27-19.000.
Ceriani, Roberto L.; and Peterson, Jerry A., to Children's Hospital Medical Center of Northern California. Method and composition for protein immobilization. 4,572,901, Cl. 436-528.000.
Cervantes Patino, Damian: *See—*
Herrera Giammattei, Octavio; Veramontes Brown, Federico; Beltran Leyva, Benedo; and Cervantes Patino, Damian, 4,572,068, Cl. 101-35.000.
Cetus Corporation: *See—*
Koths, Kirston E.; and Halenbeck, Robert F., 4,572,798, Cl. 260-112.00R.
CGR/MEV: *See—*
Azam, Guy; Convert, Guy; Dufour, Jacques; Jasmin, Claude; and Sidi, Joel, 4,572,190, Cl. 128-399.000.
Chambers, Henry B. Releasable clamping assembly for use with hydraulic jacking apparatus. 4,572,481, Cl. 254-106.000.
Chang, Irving B.; and Beckwith, Robert E., to Allied Corporation. Polyterpene resin composition containing a blend of low molecular weight polyethylene based polymers. 4,572,874, Cl. 428-523.000.
Chang, Victor, to Instituto Venezolano de Investigaciones Cientificas (I.V.I.C.). Rotary vane type I.C. engine with built-in scavenging air blower. 4,572,121, Cl. 123-203.000.
Chapdelaine, Paul: *See—*
Hug, Paul; Umeda, William; Chapdelaine, Paul; and Paul, Raymond E., 4,572,421, Cl. 228-103.000.
Chapelsky, Orest, to Lansinger, Jere R.; and Fedorowycz, Bohdan W. Oil level detector. 4,572,097, Cl. 116-227.000.
Chapin, Richard D. Drip irrigation system employing adjacently arranged flow-restricting passages. 4,572,756, Cl. 156-203.000.

Chapman, Richard L.: *See—*
Breakey, Fred B.; Barber, Leo D.; Chapman, Richard L.; Godin, Norman; Henry, Robert; Jackson, Claude; Romberger, John; and Seidl, Rudolph, 4,572,381, Cl. 211-94.000.

Chatfield, William W., to Transamerica Delaval Inc. Fabrication apparatus for cushioned line support. 4,571,803, Cl. 29-235.000.

Cheeseman, Brian, to Roboserve Limited. Mechanism for cup dispenser. 4,572,404, Cl. 221-223.000.

Chemical Specialties Manufacturing Corporation: *See—*
Savanuck, Daniel F., 4,572,690, Cl. 401-200.000.

Chen, Ching-Jen: *See—*
Chen, Ching-Wen; and Chen, Ching-Jen, 4,571,764, Cl. 7-107.000.

Chen, Ching-Wen; and Chen, Ching-Jen. Multi-purpose electrotechnological pliers. 4,571,764, Cl. 7-107.000.

Chen, Daniel Y.: *See—*
Barker, Robert E., Jr.; and Chen, Daniel Y., 4,573,010, Cl. 324-158.00F.

Chen, Shu-Chun; and Tseng, Samuel C., to International Business Machines Corp. Kanji/Chinese font generation by scaling. 4,573,199, Cl. 382-47.000.

Chen, Yok: *See—*
Abraham, Marvin M.; Boldu, Jose L.; Chen, Yok; and Orera, Victor M., 4,572,618, Cl. 350-354.000.

Cheng, Chintsai T.: *See—*
Wolski, Adam M.; Cheng, Chintsai T.; Simon, Richard B.; and Gambhirwala, Manoj C., 4,572,768, Cl. 204-15.000.

Cheng, Tien-Fu; and Chou, Lung-Chiao. Ellipsograph. 4,571,837, Cl. 33-30.100.

Chernack, Milton P. Disposable applicator. 4,572,689, Cl. 401-132.000.

Cherne Industries, Inc.: *See—*
Larson, Richard E.; Nelson, Dale K.; and Mathison, Allen D., 4,572,228, Cl. 137-15.000.

Cherry-Burrell: *See—*
Ferguson, Gary L.; and Meier, Carl H., 4,573,114, Cl. 364-138.000.

Chesebro, Robert E., Jr.; and Aigner, Philip C., to Wigwam Mills, Inc. Knit cap with integrally knit earflaps. 4,571,959, Cl. 66-169.00R.

Chesebrough-Pond's Inc.: *See—*
Bruno, Robert H.; Johns, Robert G.; Kipperman, Stuart; Mayer, Geoffrey R.; Protzmann, Donald E.; and Uhl, Robert F., 4,572,365, Cl. 206-306.000.

Chestnut, William R.; Parcell, Clive L.; Cox, Christopher J.; and MacKenzie, David J., to Deere & Company. Power press ram safety guard with electrical interlock. 4,572,346, Cl. 192-134.000.

Chevron Research Company: *See—*
Duerksen, John H.; Wall, Robert G.; and Knight, Jack D., 4,572,294, Cl. 166-273.000.
Herkenhoff, Earl F.; and Ostrander, William J., 4,573,148, Cl. 367-47.000.

Chiang, Jaw-Cheng. Apparatus for feeding steam/liquid into a steam generator. 4,572,112, Cl. 122-451.00R.

Chiari, Natale; and Inverardi, Giuseppe, to Officina Meccanica Tessile Edera S.p.A. Automatic doffing device for ring spinning and/or twisting frames, in particular in machines for producing large packages. 4,571,930, Cl. 57-274.000.

Chicago Bridge & Iron Company: *See—*
Allo, Vincent F.; and Stafford, Donald C., 4,572,287, Cl. 165-118.000.

Chikuma, Isamu: *See—*
Kanazawa, Hirotaka; Teruhiko, Takatani; Shigeki, Furutani; Chikuma, Isamu; Shimada, Satoru; and Eda, Hiroshi, 4,572,316, Cl. 180-143.000.

Children's Hospital Medical Center of Northern California: *See—*
Ceriani, Roberto L.; and Peterson, Jerry A., 4,572,901, Cl. 436-528.000.

Chitayat, Anwar, to Anorad Corporation. Method for producing air bearing pads for positioning table. 4,571,799, Cl. 29-149.50A.

Chiu, Herman S., to Union Carbide Corporation. Liquid smoke-impregnation of fibrous food casings. 4,572,098, Cl. 118-33.000.

Chou, Lung-Chiao: *See—*
Cheng, Tien-Fu; and Chou, Lung-Chiao, 4,571,837, Cl. 33-30.100.

Chowdhury, Mofazzal H.; and Ellis, Michael W., to Alfa-Laval, Inc. Backflushing system. 4,572,105, Cl. 119-14.180.

Christen, Werner, to Draiswerke GmbH. Process for gluing wood chips and the like with liquid glue and apparatus for performing the process. 4,572,845, Cl. 427-212.000.

Christofer, Donald E.: *See—*
Stock, Arthur J.; Christofer, Donald E.; Homer, John C.; Torok, Robert J.; and Whittington, Thomas, 4,572,710, Cl. 414-146.000.

Chukran, Rudolph E.: *See—*
Gaudet, James L.; Lineman, Harry L.; Chukran, Rudolph E.; Neuman, Grover H.; and Barnes, Johnny G., 4,573,138, Cl. 364-900.000.

Chung, Daniel A., to Goodyear Tire & Rubber Company, The. Aqueous polyester/epoxy emulsion treatment for yarn, method of preparation and a rubber/cord composite. 4,572,863, Cl. 428-250.000.

Chupick, Ronald, to General Motors Corporation. Plastic wheel opening molding. 4,572,558, Cl. 293-128.000.

Church, John G. Gas-metal-arc welding process. 4,572,942, Cl. 219-137.420.

Cianfichi, Kenneth P.: *See—*
Stettner, Ernest R.; Cianfichi, Kenneth P.; and Stoltman, Donald D., 4,572,436, Cl. 239-585.000.

Ciba-Geigy Corporation: *See—*
Goodin, Jonathan W.; and Irving, Edward, 4,572,890, Cl. 430-325.000.

Cipher Data Products, Inc.: *See—*
Barton, William M., Jr.; Murphy, John F.; Offerman, Karl B.; and Fisher, Richard G., 4,573,091, Cl. 360-93.000.

Cipolla, Thomas M., to General Electric Company. Adaptive gripping device. 4,572,564, Cl. 294-88.000.

Cirkel, Hans-Jurgen; Bette, Willi; and Muller, Reinhard, to Kraftwerk Union Aktiengesellschaft. Excitation circuit for a TE high-energy laser system. 4,573,160, Cl. 372-38.000.

Ciszek, Theodore F., to United States of America, Energy. Method and apparatus for casting conductive and semi-conductive materials. 4,572,812, Cl. 264-25.000.

Clarion Co., Ltd.: *See—*
Kasukave, Tetsuro, 4,572,013, Cl. 74-50.000.

Clarizo, Vito. Easily cleanable animal enclosure. 4,572,107, Cl. 119-17.000.

Clavert, Daniel V.: *See—*
Meuwly, Michael S.; Roberts, James A.; Gilbert, James F.; Clavert, Daniel V.; and Green, James B. P., Jr., 4,571,916, Cl. 53-48.000.

Clayton, John: *See—*
Pryputniewicz, Ryszard J.; Clayton, John; and Waters, Robert A., 4,572,599, Cl. 339-5.00R.

Clegg, John E. Conical beam concentrator. 4,572,621, Cl. 350-432.000.

Clement, Cornelis J.: *See—*
Heuker of Hoek, Johannes G. J.; Clement, Cornelis J.; and van der Lee, Ernst M., 4,573,043, Cl. 340-571.000.

Cleverly, Dennis S.: *See—*
Kowel, Stephen T.; Kornreich, Philipp G.; and Cleverly, Dennis S., 4,572,616, Cl. 350-335.000.

Clifton, Ted G., to Arrow Oil Tools Inc. Mechanical setting tool. 4,572,290, Cl. 166-123.000.

Clinical Reference Laboratory, Inc.: *See—*
Stout, Robert L., 4,572,834, Cl. 424-86.000.

Cobb, Homer V.: *See—*
Cameron, Donald C.; Cobb, Homer V.; and Winn, Fred M., 4,572,519, Cl. 277-124.000.

Coca-Cola Company, The: *See—*
Bach, Gary, 4,572,753, Cl. 156-73.100.

Cochard, Pierre: *See—*
Bodier, Jacques; Cochard, Pierre; Merlier, Christian; and Bouquin, Edouard P., 4,572,632, Cl. 353-71.000.

Codrington, Robert S., to Varian Associates, Inc. Catheter for use with NMR imaging systems. 4,572,198, Cl. 128-653.000.

Cofadis S.A.: *See—*
Groult, Emile J. L., 4,573,130, Cl. 364-552.000.

Cognitronics Corporation: *See—*
Shepard, David H., 4,572,962, Cl. 290-55.000.

Cok, Steven P.; and Drucker, Eric R., to John Fluke Mfg. Co., Inc. Multiple-multiple modulus prescaler for a phase-locked loop. 4,573,023, Cl. 331-1.00A.

Cole, Mark T.; and Sherman, Charles F., to Nielsen Moulding Design Corp. Adjustably mountable display frame. 4,571,866, Cl. 40-152.100.

Coleman, Herby. Meat shredder. 4,572,443, Cl. 241-166.000.

Colgate-Palmolive Company: *See—*
Vesborg, Steen, 4,572,384, Cl. 215-1.00C.

Collard, David: *See—*
Copp, Frederick C.; Caldwell, Albert G.; and Collard, David, 4,572,913, Cl. 514-403.000.

Collette, Douglas P.: *See—*
Jacobs, Paul H.; and Collette, Douglas P., 4,573,208, Cl. 455-71.000.

Collins, Ian P.; and Revell, William J., to Warner-Lambert Technologies, Inc. Valve body for endoscope. 4,572,163, Cl. 128-4.000.

Columbia Gas System Service Corp.: *See—*
Malcosky, Norman D., 4,571,984, Cl. 73-19.000.

Combe, Robin H.: *See—*
Gardner, Philip D.; Combe, Robin H.; Groom, John H.; and Groom, Kenneth J., 4,571,849, Cl. 34-79.000.

Combustol Industria e Comercio Ltda.: *See—*
Gnutzmans, Ozias A., 4,573,164, Cl. 373-130.000.

Comeau, Perry J. Clean cap. 4,572,173, Cl. 128-132.00D.

Commissariat a l'Energie Atomique: *See—*
Guillaumot, Jacques, 4,571,741, Cl. 2-8.000.
Hubert, Herve ; and Musikas, Claude, 4,572,802, Cl. 534-12.000.

Commodore Business Machines: *See—*
DiOrio, David W., 4,572,506, Cl. 273-1.00E.

Communications Intelligence Corporation: *See—*
Crane, Hewitt D.; and Ostrem, John S., 4,573,196, Cl. 382-13.000.

Compagnie Generale des Etablissements Michelin: *See—*
Lescoffit, Claude, 4,572,265, Cl. 152-379.300.

Condensing Boilers Limited: *See—*
Bowen, John E., 4,572,111, Cl. 122-17.000.

Condie, Southam B. Gutter assembly. 4,571,896, Cl. 52-12.000.

Consolidated Systems, Inc.: *See—*
Parsons, Albert; and Havens, H. Norris, 4,572,701, Cl. 404-50.000.

Consultora Sides C.A.: *See—*
Barretto Garcia, Manuel; and Zapata Oviedo, Aurora, 4,572,861, Cl. 428-240.000.

Continental Gummi-Werke Aktiengesellschaft: *See—*
Entmayr, Peter; Rohde, Dieter; and Thielemann, Klaus, 4,572,262, Cl. 152-501.000.

Contraves AG: *See—*
Arndt, Klaus; and Sanvido, Saverio, 4,572,625, Cl. 350-541.000.

Convenient Energy, Inc.: *See—*
Ladt, Max A.; and Ladt, Carroll H., 4,572,086, Cl. 110-347.000.

Convert, Guy: *See—*
Azam, Guy; Convert, Guy; Dufour, Jacques; Jasmin, Claude; and Sidi, Joel, 4,572,190, Cl. 128-399.000.

Conwed Corporation: *See*—
Koerschner, Lou Anne; Sloumb, Robert C.; and Weber, William E., 4,571,779, Cl. 24-30.50S.

Cooper, David H.: *See*—
Yoshida, Morihiko; and Cooper, David H., 4,572,164, Cl. 128-6.000.

Cooper, Herbert C.: *See*—
Oates, Robert M.; Cooper, Herbert C.; and Houser, Kirk D., 4,573,215, Cl. 455-607.000.

Cooper, J. Carl. Noise reduction system for video signals. 4,573,070, Cl. 358-36.000.

Coopers Filters Limited: *See*—
Gladstone, Robert S., 4,572,147, Cl. 123-556.000.

Copeland, Timothy E. Convertible dining table and work counter. 4,572,081, Cl. 108-17.000.

Copp, Frederick C.; Caldwell, Albert G.; and Collard, David, to Burroughs Wellcome Co. Use of 3-(arylmethyleneamino)-1-aryl-2-pyrazolines in the prophylaxis and treatment of inflammation, pain, pyresis, and asthma. 4,572,913, Cl. 514-403.000.

Corbin, John. Method and apparatus for measuring surface roughness. 4,573,131, Cl. 364-554.000.

Corby, Nelson R., Jr., to General Electric Company. Integrated lighting and camera system. 4,573,073, Cl. 358-96.000.

Corcliff Corporation: *See*—
Bedell, Edward L., 4,572,482, Cl. 266-47.000.

Cordis Corporation: *See*—
Gould, Sheldon D.; and Riggs, Gary T., 4,572,186, Cl. 128-341.000.

Corning Glass Works: *See*—
Bellman, Robert H.; Borrelli, Nicholas F.; Morse, David L.; and Sachenik, Paul A., 4,572,611, Cl. 350-167.000.

Cosentino, Edward. Apparatus for laying tile. 4,571,910, Cl. 52-391.000.

Costa, Giancarlo, to Olimpic Di Costa Lorenzo & C. S.N.C. Electric steam iron. 4,571,862, Cl. 38-77.810.

Cote , Paul T., to General Electric Company. Higher efficiency incandescent lighting unit having an improved ballast unit. 4,572,991, Cl. 315-240.000.

Couch, Robert P.: *See*—
Rosenbush, David M.; and Couch, Robert P., 4,573,123, Cl. 364-431.020.

Coulon, Philip S., Jr., to Kollmorgen Technologies Corporation. Brushless tachometer. 4,572,999, Cl. 318-618.000.

Coulter, Stanley M., to Dravo Corporation. Pallet construction for traveling grate machines. 4,572,484, Cl. 266-179.000.

Countryman, Roger S., Jr., to Motorola, Inc. Common floating gate programmable link. 4,573,144, Cl. 365-185.000.

Cox, Christopher J.: *See*—
Chestnut, William R.; Parcell, Clive L.; Cox, Christopher J.; and MacKenzie, David J., 4,572,346, Cl. 192-134.000.

Craig, Chapman C. Rotational shelf apparatus. 4,572,595, Cl. 312-305.000.

Crain, Richard W.: *See*—
Heideman, Robert J.; Holden, Jerry B.; and Crain, Richard W., 4,571,870, Cl. 42-1.00A.

Crane, Hewitt D.; and Ostrem, John S., to Communications Intelligence Corporation. Confusion grouping of strokes in pattern recognition method and system. 4,573,196, Cl. 382-13.000.

Crawford, Gerald J.: *See*—
Wilson, James G.; and Crawford, Gerald J., 4,572,293, Cl. 166-250.000.

Cressey, John R.; and Miller, Stephen A., to Case Communications Inc. Variable digital frequency generator with value storage. 4,573,175, Cl. 377-44.000.

Crimmins, Thomas R. Method for automatic recognition of two-dimensional shapes. 4,573,197, Cl. 382-22.000.

Cristante, Guido, to I.P.E. Nuova Bialetti S.p.A. Industria Prodotti Elettrodomastici. Household appliance for treating fruit and vegetables. 4,572,445, Cl. 241-37.500.

Croley, Donald F.; and Dyer, Stanley, to International Business Machines Corporation. Repetitive mode for thermal printing lift-off correction. 4,572,687, Cl. 400-696.000.

Cronk, Richard V.; and Nielsen, Jean-Paul. Preventive knee brace. 4,572,170, Cl. 128-80.00C.

Crooks, Michael J., to Bioglan Laboratories; and Bioglan, Inc. Clear micellized solutions of fat soluble essential nutrients. 4,572,915, Cl. 514-458.000.

Cross, Peter E.: *See*—
Campbell, Simon F.; Cross, Peter E.; Stubbs, John K.; and Arrowsmith, John E., 4,572,908, Cl. 514-340.000.
Campbell, Simon F.; Cross, Peter E.; and Stubbs, John K., 4,572,909, Cl. 514-356.000.

Crowley, James A.: *See*—
Nash, Dudley O.; and Crowley, James A., 4,571,936, Cl. 60-39.310.

Crowley, Raymond R.; Eckert, Alton B.; and Soderberg, John H., to Pitney Bowes Inc. Electronic postage meter having interlock between mechanical and electrical registers. 4,573,174, Cl. 377-39.000.

Crown Technology Corporation: *See*—
Mueller, Thomas D.; and Gessner, James D., 4,572,229, Cl. 137-99.000.

CSELT Centro Studi e Laboratori Telecomunicazioni S.p.A.: *See*—
Alaria, Gian B.; Destefanis, Paolo; and Poggio, Cesare, 4,573,074, Cl. 358-136.000.

CTX Corporation: *See*—
Bloom, Terry R., 4,572,754, Cl. 156-89.000.

Cunningham, Douglas J.; Else, Robert F.; and Harries, David A., to Britax (Wingard) Limited. Anchorage means for vehicle safety belts. 4,572,544, Cl. 280-808.000.

Currie, Robert J.; Spencer, Billie M.; Zscheile, John W., Jr.; and Rattlingourd, Glen D., to Sperry Corporation. Maximum likelihood sequence decoder for linear cyclic codes. 4,573,155, Cl. 371-37.000.

Curtis, G. Stephen; and Whipple, David P., to Hewlett-Packard Company. FM Modulator phase-locked loop with FM calibration. 4,573,026, Cl. 332-18.000.

Cutler, Christopher A.; Wallace, William D.; and Westenskow, Dwayne R., to Utah Medical Products, Inc. Metabolic gas monitoring apparatus and method. 4,572,208, Cl. 128-718.000.

Dahlke, Gerald: *See*—
Arnold, Herbert; Horbelt, Michael; and Dahlke, Gerald, 4,572,142, Cl. 123-478.000.

Daifotes, Theodore S. Compact, animal-operated animal feeder. 4,572,108, Cl. 119-51.00R.

Daimler-Benz Aktiengesellschaft: *See*—
Ordu, Armin, 4,572,260, Cl. 152-158.000.
Reininger, Siegfried; and Wiesmeier, Albert, 4,572,619, Cl. 350-392.000.

Dainippon Screen Mfg. Co., Ltd.: *See*—
Sakamoto, Takashi, 4,573,071, Cl. 358-76.000.

Dainippon Screen Seizo Kabushiki Kaisha: *See*—
Hashiyama, Hideshi; Araki, Shuichi; and Ogura, Michio, 4,573,201, Cl. 382-56.000.

Dalferth, Hans H.: *See*—
Rieger, Werner; Dalferth, Hans H.; and Eberhardt, Franz, 4,571,934, Cl. 59-90.000.

Dallmann, Hermann; and Palmer, Hans J., to Hoechst Aktiengesellschaft. Multilayer film with a gas and aroma barrier layer and a process for the preparation and application thereof. 4,572,854, Cl. 428-35.000.

Dalmau Guell, Jose M., to Jumberca, S.A. Yarn feeder for circular knitting machine equipped with stripers. 4,571,958, Cl. 66-132.00R.

Daly, Charles J., to United States of America, Army. Method and apparatus for measuring the hydraulic conductivity of porous materials. 4,571,985, Cl. 73-38.000.

Dammann, Heinrich: *See*—
Sebb, Werner; and Dammann, Heinrich, 4,572,825, Cl. 423-173.000.

Damouny, Nabil G.; and Huang, Min-Siu, to Fairchild Camera & Instrument Corporation. Microprocessor with branch control. 4,573,118, Cl. 364-200.000.

Danfoss A/S: *See*—
Hellegaard, Kjeld; Doktor, Hans; and Jacobsen, Niels O., 4,572,969, Cl. 307-254.000.

Dangler, Charles C. Golf shoe cleat cleaner. 4,571,767, Cl. 15-161.000.

Danner, Bernard, to Sandoz Ltd. Method for degreasing natural skins, hides and pelts. 4,572,721, Cl. 8-94.10R.

Dash, Glen R., to Dash Strauss Associates. High speed link for rotating display. 4,573,048, Cl. 340-870.370.

Dash Strauss Associates: *See*—
Dash, Glen R., 4,573,048, Cl. 340-870.370.

Daugherty, James D., to General Motors Corporation. Battery temperature sensor and housing therefor. 4,572,878, Cl. 429-62.000.

Davis, Chester A.: *See*—
Hsiung, Du Y.; Davis, Chester A.; and Nicholson, Harold J., 4,572,220, Cl. 132-7.000.

Day, John T.; and Udy, Lex L., to Mining Services International Corporation. Methods and apparatus for loading a borehole with explosives. 4,572,075, Cl. 102-313.000.

De Soto, Inc.: *See*—
Lentz, William L., 4,572,156, Cl. 126-140.000.

Dealy, John M. Method and apparatus for measuring rheological properties of fluid. 4,571,989, Cl. 73-60.000.

Dean, Raymond H., to Tempmaster Corporation. Sound attenuator. 4,572,327, Cl. 181-295.000.

DeCastro, Eugene: *See*—
Stohl, Clark E.; and DeCastro, Eugene, 4,572,184, Cl. 128-328.000.

Deckard, John I., to General Motors Corporation. Electromagnetic unit fuel injector. 4,572,433, Cl. 239-88.000.

Deenadayalu, R. Paul. Lighted ear canal curette instrument. 4,572,180, Cl. 128-304.000.

Deere & Company: *See*—
Chestnut, William R.; Parcell, Clive L.; Cox, Christopher J.; and MacKenzie, David J., 4,572,346, Cl. 192-134.000.
Grabler, Wolfgang; and Klepsch, Werner, 4,571,804, Cl. 29-235.000.
Weiss, Heinz, 4,572,026, Cl. 74-700.000.

DeFouw, Jerry A.; and Kelley, James O., to Herman Miller, Inc. Frame connector system. 4,571,907, Cl. 52-239.000.

de France, Henri G. System for the automatic observation and quantification of phenomena capable of being detected by fluorescence. 4,573,195, Cl. 382-6.000.

Deguchi, Toshihisa; Ohta, Kenji; Takahashi, Akira; and Yamaoka, Hideyoshi, to Sharp Kabushiki Kaisha. Magneto-optical head assembly with improved detection means. 4,573,149, Cl. 369-13.000.

DeHart, Arnold O.: *See*—
Symons, James D.; Dershem, Ronald J.; and DeHart, Arnold O., 4,572,516, Cl. 277-50.000.

Dehuff, John A.: *See*—
Robinson, Stewart W.; Bartram, Roger W.; and Dehuff, John A., 4,572,737, Cl. 75-53.000.

de Irureta-Goyena, Anthony: *See*—
Hursh, David F.; and de Irureta-Goyena, Anthony, 4,571,960, Cl. 66-196.000.

DeLeon, Alberto: *See*—
Gluck, David G.; DeLeon, Alberto; and Oliver, John P., 4,572,865, Cl. 428-309.900.

Delphic Research Laboratories, Inc.: *See—*
Ellis, Harold, 4,572,862, Cl. 428-245.000.

Deman, Pierre; and Butin, Henri, to Thomson CSF. Fixed station of a radiocommunications system with frequency jumps and two-way transmitters. 4,573,209, Cl. 455-73.000.

Demopoulos, Andreas. Internal combustion engine with rankine bottoming cycle. 4,571,946, Cl. 60-618.000.

Dempsey, Barry J.: *See—*
Mantarro, Joseph; Liu, Keh-Chang; and Dempsey, Barry J., 4,572,700, Cl. 404-35.000.

Dentool, Inc.: *See—*
Rosenfeld, Marvin L., 4,572,223, Cl. 132-84.00R.

Deptolla, Bernd: *See—*
Lange, Dieter; and Deptolla, Bernd, 4,572,468, Cl. 248-394.000.

Derlich, Hans-Joachim, to Klein, Schanzlin & Becker Aktiengesellschaft. Mounting assembly for machines. 4,572,474, Cl. 248-639.000.

Dershem, Ronald J.: *See—*
Symons, James D.; Dershem, Ronald J.; and DeHart, Arnold O., 4,572,516, Cl. 277-50.000.

Desaultels, Remi: *See—*
Lamarche, Raymond B.; Bhandari, Baldev; Desaultels, Remi; and Drolet, Pierre, 4,571,852, Cl. 36-32.00R.

Desjardins, Warren. Interlocking lock screw with screw driver. 4,572,039, Cl. 81-451.000.

DeSoto, Inc.: *See—*
Krajewski, John J., 4,572,610, Cl. 350-96.340.

Destefanis, Paolo: *See—*
Alaria, Gian B.; Destefanis, Paolo; and Poggio, Cesare, 4,573,074, Cl. 358-136.000.

Dettmers, Michael: *See—*
Weirich, Walter; and Dettmers, Michael, 4,572,709, Cl. 405-302.000.

Deutsche Forschungs- und Versuchsanstalt fur Luft- und Raumfahrt e.V.: *See—*
Hinz, Bernhard; and Gruninger, Gerhard, 4,572,058, Cl. 92-187.000.

Deutsche Gesellschaft fur Wiederaufarbeitung von Kernbrennstoffen mbH: *See—*
Popp, Franz-Wolfgang; and Feuring, Kurt, 4,572,959, Cl. 250-506.100.

Deutschmann, Herbert; Schmidt, Erhard; and Wolters, Gerd-Michael, to MTU Motoren- und Turbinen-Union Friedrichshafen GmbH. Diesel internal combustion engine. 4,572,148, Cl. 123-559.000.

DiBartolo, Alfred. Holder for breakable karate board. 4,572,504, Cl. 272-76.000.

Dickerson, Richie H.: *See—*
Wheless, Jack C.; and Dickerson, Richie H., 4,571,917, Cl. 53-148.000.

Dickey, Joseph W.; and Powell, Lloyd E., to United States of America, Navy. Acoustical testing of hydraulic actuators. 4,571,994, Cl. 73-168.000.

Diehl, Edwin: *See—*
Lisfeld, Robert; and Diehl, Edwin, 4,572,614, Cl. 350-315.000.

Diehl GmbH & Co.: *See—*
Politzer, Anton; Heberlein, Werner; and Konicke, Helmut, 4,572,076, Cl. 102-431.000.
Wiesner, Hagen-Heinz; and Mattern, Heinz E., 4,572,588, Cl. 305-58.0PC.

Dieterich, Charles B., to RCA Corporation. Digital lowpass filter having controllable gain. 4,573,135, Cl. 364-724.000.

Dietrich, Anton; Hartig, Klaus; and Scherer, Michael, to Leybold-Heraeus GmbH. Method and apparatus for reactive vapor deposition of compounds of metal and semi-conductors. 4,572,842, Cl. 427-39.000.

Digital Equipment Corporation: *See—*
Hertrich, Friedrich R., 4,572,460, Cl. 242-195.000.

Dimitriou, Michael H., to W. Schmidt GmbH & Co. K.G. Plate evaporator or condenser. 4,572,766, Cl. 159-28.000.

Dingwall, Andrew G. F., to RCA Corporation. Method of making a capacitor with standard self-aligned gate process. 4,571,816, Cl. 29-571.000.

DiOrio, David W., to Commodore Business Machines. Raster line comparator circuit for video game. 4,572,506, Cl. 273-1.00E.

Dittmar, Wilfried: *See—*
Franz, Reinhard; Dittmar, Wilfried; Scheidegger, Christian; and Frohlich, Roland, 4,572,048, Cl. 84-1.190.

Dixon, Samuel, Jr.; and Jacobs, Harold, to United States of America, Army. Dual Gunn diode self-oscillating mixer. 4,573,213, Cl. 455-330.000.

Dr. Ing. h.c.F. Porsche Aktiengesellschaft: *See—*
Hausinger, Otto, 4,572,018, Cl. 74-397.000.
Hetmann, Richard; and Ziegler, Hermann, 4,571,884, Cl. 49-72.000.

Dr. Johannes Heidenhain GmbH: *See—*
Nelle, Gunther, 4,573,000, Cl. 318-640.000.

Dodgson, Robert: *See—*
Porter, Malcolm; and Dodgson, Robert, 4,572,673, Cl. 366-127.000.

Dodier, Jacques. Hydrokinetic injector, particularly for balneotherapeutic applications. 4,572,165, Cl. 128-24.100.

Doerbeck, Friedrich H.: *See—*
McLevige, William V.; Yuan, Han-Tzong; Duncan, Walter M.; and Doerbeck, Friedrich H., 4,573,064, Cl. 357-16.000.

Doktor, Hans: *See—*
Hellegaard, Kjeld; Doktor, Hans; and Jacobsen, Niels O., 4,572,969, Cl. 307-254.000.

Dolazza, Enrico, to Analogic Corporation. Digital x-ray system. 4,573,035, Cl. 340-347.0AD.

Dollison, William W., to Otis Engineering Corporation. Hydraulic well pump. 4,571,939, Cl. 60-372.000.

Dominick, George C., to Union Carbide Corporation. Process for cleaning the interior of a conduit having bends. 4,572,744, Cl. 134-7.000.

Donelli, Giordano: *See—*
Ghielmetti, Giuseppe; Casale, Liborio; and Donelli, Giordano, 4,572,806, Cl. 260-465.00G.

Donner, Meinrad, to Maag Gear-Wheel and Machine Company Limited. Apparatus for compensating for dressing tool wear during the dressing of grinding wheels. 4,571,891, Cl. 51-165.870.

Donomoto, Tadashi: *See—*
Funatani, Kiyoshi; Donomoto, Tadashi; Tanaka, Atsuo; and Tatematsu, Yoshiaki, 4,572,270, Cl. 164-97.000.

Dooley, John C., Jr.; and Pikulski, Richard. Ski-pole hand shield. 4,572,545, Cl. 280-821.000.

Dorosz, Dennis D. E. Journal bushing drill bit construction. 4,572,306, Cl. 175-371.000.

Dorr, Steve, to Centronics Data Computer Corp. Slaved ramp voltage generator for a calligraphic character printer. 4,572,679, Cl. 400-17.000.

Dorsey, Denis P.; Sepp, Walter E.; and Pritchard, Dalton H., to RCA Corporation. Video signal processor for progressive scanning. 4,573,068, Cl. 358-11.000.

Dosaka, Akira, to Ikari Machine Tools Co., Ltd. Track slider grinder. 4,571,890, Cl. 51-92.0ND.

Doughty, Val J. I V Pole interconnection coupling. 4,572,536, Cl. 280-289.0WC.

Douglas, Bruce J.: *See—*
Mahar, Larry J.; and Douglas, Bruce J., 4,572,304, Cl. 175-5.000.

Douglas, Edward; and Webb, Maurice I., to National Research Development Corporation. Separation method and apparatus. 4,572,378, Cl. 209-640.000.

Dow Chemical Company, The: *See—*
Beaver, R. Neal; Byrd, Carl E.; and Alexander, Lloyd E., 4,572,770, Cl. 204-98.000.
Mullins, Michael J., 4,572,804, Cl. 260-453.00P.
Priddy, Duane B.; and Pirc, Michael, 4,572,819, Cl. 422-62.000.
Wolcott, Richard A., 4,572,788, Cl. 210-670.000.

Dow Corning Corporation: *See—*
Graiver, Daniel; and Kalinowski, Robert E., 4,572,917, Cl. 521-68.000.
Lee, Chi-Long; and Rabe, James A., 4,572,918, Cl. 521-91.000.

Dow Corning, Ltd.: *See—*
Naylor, Clifford; and Pocknell, David, 4,572,814, Cl. 264-46.400.

Dowa Mining Co., Ltd.: *See—*
Abe, Hideki; and Tanaka, Hiroshi, 4,572,822, Cl. 423-37.000.

Dowell Schlumberger Incorporated: *See—*
Cameron, Donald C.; Cobb, Homer V.; and Winn, Fred M., 4,572,519, Cl. 277-124.000.

Dragerwerk Aktiengesellschaft: *See—*
Walther, Hans-Joachim, 4,572,176, Cl. 128-204.260.

Draiswerke GmbH: *See—*
Christen, Werner, 4,572,845, Cl. 427-212.000.

Dravo Corporation: *See—*
Coulter, Stanley M., 4,572,484, Cl. 266-179.000.

Dreibelbis, Richard C., to Emerson Electric Co. (H&H Precision Products Div.). Valve assembly for a dispensing head. 4,572,411, Cl. 222-469.000.

Dreschel, Jurgen; Mobs, Heinrich; and Hog, Peter, to Bell & Howell Company GmbH. Method and apparatus for collecting form sheets in a set thereof. 4,572,497, Cl. 270-58.000.

Drexelbrook Engineering Company: *See—*
Maltby, Frederick L.; and Kramer, L. Jonathan, 4,573,040, Cl. 340-511.000.

Drexler, Jerome, to Drexler Technology Corporation. Method for recording medical data in two modes. 4,572,891, Cl. 430-346.000.

Drexler Technology Corporation: *See—*
Drexler, Jerome, 4,572,891, Cl. 430-346.000.

Driggers, John M.; Saska, Thomas J.; and Kitzes, Arnold S., to Westinghouse Electric Corp. Process for uniting sleeve members by brazing. 4,572,938, Cl. 219-85.0BM.

Driscoll, John S.; and Palka, Robert E., to Illinois Carbon Products. Apparatus for slitting and winding tape. 4,572,452, Cl. 242-56.200.

Driver, Kenneth D.: *See—*
Mauldin, Donald M.; and Jones, Richard E., III, 4,572,169, Cl. 128-80.00H.

Drolet, Pierre: *See—*
Lamarche, Raymond B.; Bhandari, Baldev; Desaultels, Remi; and Drolet, Pierre, 4,571,852, Cl. 36-32.00R.

Drori, Mordeki. Multiple-disc filters. 4,572,784, Cl. 210-133.000.

Drost, Adrian D.; and Ruscher, Edward H., to Kimberly-Clark Corporation. T-Seal for polymeric extrusion system. 4,572,521, Cl. 277-167.500.

Drucker, Eric R.: *See—*
Cok, Steven P.; and Drucker, Eric R., 4,573,023, Cl. 331-1.00A.

Drumm, Donald E., to Wang Laboratories, Inc. Control device. 4,573,110, Cl. 362-319.000.

Drumm, Volker: *See—*
Bluhm, Dieter H.; and Drumm, Volker, 4,572,458, Cl. 242-131.000.

Drury, Geoffrey, to Agrownautics, Inc. Pneumatic bagger ring. 4,572,251, Cl. 141-1.000.

Dudley, Troy W.: *See—*
Ellis, Laura; Caram, Joe M.; Cantu, John R.; Dudley, Troy W.; and Callahan, Mitchell A., 4,572,533, Cl. 280-242.0WC.

Dudome, Michel; and Dupressoir, Albert, to Thomson CSF. Dipole radiator excited by a shielded slot line. 4,573,056, Cl. 343-795.000.

Duerksen, John H.; Wall, Robert G.; and Knight, Jack D., to Chevron Research Company. Non-condensible gas injection including alpha-olefin sulfonate surfactant additives. 4,572,294, Cl. 166-273.000.

Dufour, Jacques: *See—*
Azam, Guy; Convert, Guy; Dufour, Jacques; Jasmin, Claude; and Sidi, Joel, 4,572,190, Cl. 128-399.000.

Duguet, Jean-Pierre: *See—*
Brodard, Eric; Duguet, Jean-Pierre; Mallevialle, Joel; and Roustan, Michel, 4,572,821, Cl. 422-186.120.

Duke University: *See—*
Riederer, Stephen J., 4,573,014, Cl. 324-307.000.

Dukes, Janet L.: *See—*
Sutera, Richard; Burchett, Roger C.; and Dukes, Janet L., 4,573,057, Cl. 346-1.100.

Duncan, Walter M.: *See—*
McLevige, William V.; Yuan, Han-Tzong; Duncan, Walter M.; and Doerbeck, Friedrich H., 4,573,064, Cl. 357-16.000.

Dunlap, David R.; and Brown, Eugene N., to Refractory Anchors, Inc. Modular insulation anchor. 4,571,911, Cl. 52-509.000.

Duphar International Research B.V.: *See—*
van Hes, Roelof; and Grosscurt, Arnoldus C., 4,572,914, Cl. 514-403.000.

Duplessis, Philippe: *See—*
Grauel, Christoph; Duplessis, Philippe; and Tarabout, Alain, 4,573,206, Cl. 455-33.000.

Du Pont de Nemours, E. I., and Company: *See—*
Fan, Roxy N., 4,572,764, Cl. 156-630.000.
Vasta, Joseph A., 4,572,870, Cl. 428-416.000.

Dupressoir, Albert: *See—*
Dudome, Michel; and Dupressoir, Albert, 4,573,056, Cl. 343-795.000.

Durand, Jean-Claude: *See—*
Bouko, Jean; Durand, Jean-Claude; Le Foll, Jean; and Salvat, Francois, 4,573,054, Cl. 343-786.000.

Durand, William W.; and Knowles, Gary R., to Honeywell Inc. Infrared imager. 4,572,958, Cl. 250-495.100.

Durham, Claudia; and Hopkins, Jeffrey E. Exercise device for attachment to a wheelchair. 4,572,501, Cl. 272-73.000.

Duyvesteyn, Willem P. C.; and Jha, Mahesh C., to Amax Inc. Zinc recovery from steel plant dusts and other zinciferous materials. 4,572,771, Cl. 204-118.000.

Dyer, Henry B. Abrasive compacts. 4,572,722, Cl. 51-309.000.

Dyer, Stanley: *See—*
Croley, Donald F.; and Dyer, Stanley, 4,572,687, Cl. 400-696.000.

Dyett, Derek H.; Hoath, Grantley R.; and Horsley, John K., to Molins Limited. Apparatus for conveying rod-like articles. 4,572,352, Cl. 198-457.000.

Dyson, James, to Prototypes, Ltd. Upright vacuum cleaning appliance. 4,571,772, Cl. 15-335.000.

E. C. H. Will GmbH & Co.: *See—*
Besemann, Alfred, 4,572,350, Cl. 198-372.000.

E.M.M. Emiliana Macchine Maglierie s.r.l.: *See—*
Stoppazzini, Benito, 4,571,955, Cl. 66-75.100.

Early, Betty J.: *See—*
Early, William C.; and Early, Betty J., 4,572,532, Cl. 280-154.50R.

Early, William C.; and Early, Betty J. Mud flap holder for trucks. 4,572,532, Cl. 280-154.50R.

Earth Technology Corporation, The: *See—*
Mahar, Larry J.; and Douglas, Bruce J., 4,572,304, Cl. 175-5.000.

Eastman Kodak Company: *See—*
Hoyen, Harry A., 4,572,892, Cl. 430-410.000.
Joseph, Brian J.; and Rumsey, Stephen C., 4,572,417, Cl. 226-20.000.

Eaton Corporation: *See—*
Jones, Jack E.; Fajner, Michael J.; and Zepnick, Ronald E., 4,572,601, Cl. 339-46.000.

Eberhardt, Franz: *See—*
Rieger, Werner; Dalferth, Hans H.; and Eberhardt, Franz, 4,571,934, Cl. 59-90.000.

Ebneth, Harold; Fitzky, Hans G.; Wolf, Gerhard D.; and Giesecke, Henning, to Bayer Aktiengesellschaft. Use of metallized knitted net fabrics for protection against microwave radiation. 4,572,960, Cl. 250-516.100.

Eckert, Alton B.: *See—*
Crowley, Raymond R.; Eckert, Alton B.; and Soderberg, John H., 4,573,174, Cl. 377-39.000.

Economopoulos, Peter C.: *See—*
Ong, Richard H.; Economopoulos, Peter C.; and Guenthner, Russell W., 4,573,116, Cl. 364-200.000.

Eda, Hiroshi: *See—*
Kanazawa, Hirotaka; Teruhiko, Takatani; Shigeki, Furutani; Chikuma, Isamu; Shimada, Satoru; and Eda, Hiroshi, 4,572,316, Cl. 180-143.000.

Edens, Robert B., to Her Investments. Knot latch device. 4,571,854, Cl. 36-50.000.

Eder, Jeffrey S., to Westinghouse Electric Corp. Electric motor flexible mounting system and method of assembly. 4,572,472, Cl. 248-605.000.

Egatec S.A.: *See—*
Fallot, Jean-Francois, 4,572,773, Cl. 204-201.000.

Ehrhart, Karl-Josef: *See—*
Heuberger, Erich; Knorrich, Wolf-Dieter; and Ehrhart, Karl-Josef, 4,572,422, Cl. 229-7.00R.

Eidenschink, Rudolf; and Weber, Georg, to Merck Patent Gesellschaft mit beschrankter Haftung. Acetonitriles, their preparation, and dielectrics and electro-optical display elements containing them. 4,572,794, Cl. 252-299.200.

Eiichi, Sonoda: *See—*
Masayuki, Kiyosawa; Nobuaki, Inoue; and Eiichi, Sonoda, 4,572,727, Cl. 55-414.000.

Eilender, Kasriel; and Stand, Mille. Low friction bed pad. 4,572,174, Cl. 128-149.000.

Eisele Apparate-und Geratebau GmbH: *See—*
Taddicken, Hermann, 4,572,094, Cl. 112-322.000.

Eisenhauer, Elroy C. Tool constructions for removing frozen nuts. 4,572,035, Cl. 81-53.200.

Eisermann, Armin, to Schulte-Schlagbaum Aktiengesellschaft. Storeroom for transport carts, particularly supermarket shopping carts or the like. 4,572,347, Cl. 194-205.000.

Eisermann, Armin; ten Eicken, Heinz; Obenluneschloss, Kurt; and Geiger, Diethard, to Schulte-Schlagbaum Aktiengesellschaft. Lock, particularly a coin-deposit lock. 4,572,348, Cl. 194-248.000.

El.PO s.r.l.: *See—*
Ponzi, Renato; and Ellenberg, Martin, 4,572,252, Cl. 141-90.000.

Elementanalys Almen & Gronberg AB: *See—*
Gronberg, Thomas; Almen, Torsten; Golman, Klaes; Mattsson, Soren; and Sjoberg, Staffan, 4,573,181, Cl. 378-45.000.

Elfab Corp.: *See—*
Ammon, J. Preston; Weaver, Harry R.; and Evans, Evan J., 4,572,604, Cl. 339-176.0MP.

Elia, Thomas L. Snow plow dolly. 4,572,531, Cl. 280-62.000.

Ellenberg, Martin: *See—*
Ponzi, Renato; and Ellenberg, Martin, 4,572,252, Cl. 141-90.000.

Ellenberger & Poensgen GmbH: *See—*
Krasser, Fritz, 4,573,031, Cl. 337-68.000.

Elliott, Charles T.; and White, Anthony M., to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the. Infra red photo detector systems. 4,572,953, Cl. 250-338.000.

Elliott Turbomachinery Co., Inc.: *See—*
Greene, Kenneth H.; and Geary, Carl H., 4,572,663, Cl. 356-23.000.

Ellis, Harold, to Delphic Research Laboratories, Inc. Fire barrier coating composition containing magnesium oxychlorides and high alumina calcium aluminate cements or magnesium oxysulphate. 4,572,862, Cl. 428-245.000.

Ellis, Laura; Caram, Joe M.; Cantu, John R.; Dudley, Troy W.; and Callahan, Mitchell A. Wheelchair shock absorbing apparatus. 4,572,533, Cl. 280-242.0WC.

Ellis, Michael W.: *See—*
Chowdhury, Mofazzal H.; and Ellis, Michael W., 4,572,105, Cl. 119-14.180.

Elscint Inc.: *See—*
Thomenius, Kai E., 4,572,202, Cl. 128-660.000.

Elscint, Ltd.: *See—*
Inbar, Dan; and Ganin, Alexander, 4,573,122, Cl. 364-414.000.

Else, Robert F.: *See—*
Cunningham, Douglas J.; Else, Robert F.; and Harries, David A., 4,572,544, Cl. 280-808.000.

Embrey, Derek M.; Webb, Stuart F.; and Legg, Graham J., to AB Electronic Components Limited. Lamp monitoring circuit. 4,572,987, Cl. 315-77.000.

Emerson Electric Co. (H&H Precision Products Div.): *See—*
Dreibelbis, Richard C., 4,572,411, Cl. 222-469.000.

Emerson, Richard, to GKN Automotive Components, Inc. Method and an apparatus for heat treatment of a workpiece. 4,572,749, Cl. 148-16.500.

Enami, Ken, to Victor Company of Japan, Ltd. Synchronism discriminating circuit. 4,572,995, Cl. 318-314.000.

Endo, Isao, to Yks Co., Ltd. Oily water separating apparatus for the ship. 4,572,786, Cl. 210-188.000.

Energy Services Inc.: *See—*
Haeflich, Jack, 4,572,110, Cl. 122-7.00R.

Engblom, David W. Convergent flow stove. 4,572,155, Cl. 126-76.000.

Engel, Harold J. Solder paste dispenser for SMD circuit boards. 4,572,103, Cl. 118-697.000.

Engelberg, Franz; Fabris, Luciano; Schneider, Robert; Villinger, Gerhard; and Truninger, Walter, to Gautschi Electro-Fours SA. Apparatus for melting a melting stock composed of scrap metal and/or coarse scrap material. 4,572,485, Cl. 266-227.000.

Engelfried, Werner; and Mueller, Gerhard, to Terrot Strickmaschinen GmbH. Device for compensating for differences in thermal expansion in circular knitting machines. 4,571,957, Cl. 66-115.000.

Engineered Systems Inc.: *See—*
Roth, Richard W.; Gregor, William T.; Sherwood, Michael D.; and Pokrajac, Ned, 4,573,192, Cl. 382-1.000.

England, Robert W. Toilet structure for walker. 4,571,754, Cl. 4-480.000.

English Electric Valve Company Limited: *See—*
Newton, Barry P., 4,573,006, Cl. 323-326.000.

Enkner, Bernhard: *See—*
Mullner, Paul; and Enkner, Bernhard, 4,572,281, Cl. 165-1.000.

Enso-Gutzeit Oy: *See—*
Puumalainen, Pertti; and Sikanen, Pertti, 4,572,957, Cl. 250-493.100.

Enterprise Machine and Development Corp.: *See—*
Price, Samuel T., 4,571,793, Cl. 28-220.000.

Entmayr, Peter; Rohde, Dieter; and Thielemann, Klaus, to Continental Gummi-Werke Aktiengesellschaft. Vehicle wheel and pneumatic tire assembly. 4,572,262, Cl. 152-501.000.

Eppler, Arthur R.: *See—*
May, James P.; and Eppler, Arthur R., 4,572,921, Cl. 174-35.0GC.

Epson Corporation: *See*—
Miyazawa, Yoshinori; and Mizuno, Shigeki, 4,572,681, Cl. 400-124.000.

Epstein, Irving, to Washington Chain & Supply Company, Inc. Stopper for a wire rope. 4,572,565, Cl. 294-102.100.

Ernst Leitz Wetzlar GmbH: *See*—
Lisfeld, Robert; and Diehl, Edwin, 4,572,614, Cl. 350-315.000.
Schlapp, Werner; and Wiessner, Willi, 4,572,612, Cl. 350-257.000.

Esselte Pendaflex Corporation: *See*—
Kalus, Peter; and Wippern, Gerhard, 4,572,855, Cl. 428-43.000.

Essex Industries, Inc.: *See*—
Phlipot, James R.; Pinkston, Steve R.; and Seghetti, Leland L., 4,572,477, Cl. 251-285.000.

Essilor International Cie Generale d'Optique: *See*—
Tagnon, Luc, 4,572,629, Cl. 351-243.000.

Etablissement Supervis: *See*—
Mettler, Karl, 4,572,022, Cl. 74-492.000.

Etablissements Valois: *See*—
Brunet, Michel, 4,572,410, Cl. 222-402.110.

Ethicon, Inc.: *See*—
Alpern, Marvin, 4,572,363, Cl. 206-63.300.

Euler, Richard W., to Allied Corporation. Axial position lock for telescoping steering column. 4,572,023, Cl. 74-493.000.

Eumet Metallaufbereitungsgesellschaft mbH & Co.: *See*—
Poetzschke, Manfred; and Sattler, Hans-Peter, 4,572,735, Cl. 75-10.00R.

Eva-Tone Soundsheets, Inc.: *See*—
Evans, R. Evan, 4,572,513, Cl. 273-242.000.

Evans, Evan J.: *See*—
Ammon, J. Preston; Weaver, Harry R.; and Evans, Evan J., 4,572,604, Cl. 339-176.0MP.

Evans, Larry G.: *See*—
Sussman, Richard C.; and Evans, Larry G., 4,572,747, Cl. 148-3.000.

Evans, R. Evan, to Eva-Tone Soundsheets, Inc. Educational game having pre-recorded questions and answers. 4,572,513, Cl. 273-242.000.

Evans, Robert L., to University of British Columbia, The. Internal combustion engine squish jet combustion chamber. 4,572,123, Cl. 123-262.000.

EVG Entwicklungs- u. Verwertungs-Gesellschaft mbH: *See*—
Pollhammer, Edgar; Ritter, Klaus; and Ritter, Gerhard, 4,571,974, Cl. 72-217.000.

Ewing, James H., to MKS Instruments, Inc. Method of manufacturing a cartridge unit for establishing controlled laminar-flow conditions. 4,571,801, Cl. 29-157.00R.

Ex-Cell-O Corporation: *See*—
Gembinski, John C., 4,572,856, Cl. 428-71.000.
Lisiecki, Robert E., 4,572,426, Cl. 229-48.0SA.

Exotek, Inc.: *See*—
Walley, David, 4,572,295, Cl. 166-295.000.

Fabriques de Tabac Reunies S.A.: *See*—
Gaisch, Helmut; and Nyffeler, Urs, 4,572,219, Cl. 131-308.000.

Fabris, Luciano: *See*—
Engelberg, Franz; Fabris, Luciano; Schneider, Robert; Villinger, Gerhard; and Truninger, Walter, 4,572,485, Cl. 266-227.000.

Fader, Philip D.: *See*—
Thigpen, Arnold B., Jr.; Looney, Mark D.; and Fader, Philip D., 4,572,297, Cl. 166-307.000.

Fail Safe Brake Corporation: *See*—
Fontaine, William G., 4,572,319, Cl. 180-273.000.

Fairchild Camera & Instrument Corporation: *See*—
Berry, Robert L., 4,572,765, Cl. 156-643.000.
Damouny, Nabil G.; and Huang, Min-Siu, 4,573,118, Cl. 364-200.000.
Necoechea, R. Warren, 4,572,971, Cl. 307-260.000.

Fajner, Michael J.: *See*—
Jones, Jack E.; Fajner, Michael J.; and Zepnick, Ronald E., 4,572,601, Cl. 339-46.000.

Fallot, Jean-Francois, to Egatec S.A. Electroplating apparatus. 4,572,773, Cl. 204-201.000.

Fameccanica S.p.A.: *See*—
Bianco, Carlo, 4,572,043, Cl. 83-18.000.

Fan, Roxy N., to Du Pont de Nemours, E. I., and Company. Preparation of photoformed plastic multistrate by via formation first. 4,572,764, Cl. 156-630.000.

Fanuc Limited: *See*—
Nozawa, Ryoichiro; Kawamura, Hideaki; and Miyata, Mitsuto, 4,572,998, Cl. 318-572.000.

Fanuc Ltd: *See*—
Kurakake, Mitsuo; and Sakamoto, Keiji, 4,573,002, Cl. 318-721.000.

Farina, Alfonso, to Selenia S.p.A. Adaptive system for suppressing interferences from directional jammers in electronically or mechanically scanning radar. 4,573,051, Cl. 343-18.00E.

Farmer, Diane B.: *See*—
Farmer, M. Zane; and Farmer, Diane B., 4,572,253, Cl. 141-95.000.

Farmer, M. Zane; and Farmer, Diane B. Automatic level sensing system. 4,572,253, Cl. 141-95.000.

Farmer, Paul L.: *See*—
Gibeau, Frank C.; and Farmer, Paul L., 4,573,094, Cl. 360-106.000.

Farrall, George A., to General Electric Company. Apparatus for reducing the effects of thermal stresses on breakdown voltage in high voltage vacuum devices. 4,572,982, Cl. 313-348.000.

Farrell, Regis. Roller shade mounting bracket. 4,572,467, Cl. 248-257.000.

Fasano, Michael, to Porta Systems Corp. Telephone two element gas tube protector module. 4,573,100, Cl. 361-119.000.

Faulin, Antonio. Ski shoe sole. 4,571,858, Cl. 36-117.000.

Faupell, Lawrence C., to Thiokol Corporation. Method for explosively forming an auxiliary exit cone for the nozzle of a rocket motor. 4,571,800, Cl. 29-157.00C.

Fedorowycz, Bohdan W.: *See*—
Chapelsky, Orest, 4,572,097, Cl. 116-227.000.

Fehr, Duane M. Carrier for a revolver speedloader. 4,572,415, Cl. 224-253.000.

Feil, Joseph N.: *See*—
Gartland, Robert J.; and Feil, Joseph N., 4,572,852, Cl. 428-35.000.

Feinfocus Rontgensysteme GmbH: *See*—
Reinhold, Alfred, 4,573,186, Cl. 378-138.000.

Feinstein, Steven B. Contact agents for ultrasonic imaging. 4,572,203, Cl. 128-661.000.

Feith, Johann: *See*—
Giesecke, Peter; and Feith, Johann, 4,572,308, Cl. 177-1.000.

Felder, Christian, to Gebhardt Fordertechnik GmbH. Reversible stow conveyor track. 4,572,353, Cl. 198-577.000.

Feldmeier, Fritz; and Hafner, Gregor, to Georg Muller Kugellager-Fabrik K.G. Centrifugal chucking apparatus. 4,572,525, Cl. 279-1.00C.

Felix, Ernst, to Zellweger Uster Ltd. System and apparatus for the measurement of the tension of textile fabrics in textile machines. 4,572,243, Cl. 139-97.000.

Felt Products Mfg. Co.: *See*—
Smagatz, Leonard J., 4,572,522, Cl. 277-199.000.

Ferguson, Gary L.; and Meier, Carl H., to Cherry-Burrell. Valve control unit and system for use therewith. 4,573,114, Cl. 364-138.000.

Ferguson, George A.: *See*—
Kusenberger, Felix N.; Barton, John R.; and Ferguson, George A., 4,573,013, Cl. 324-238.000.

Ferranti plc: *See*—
Gooch, Ian D.; and Thom, Ian G., 4,572,660, Cl. 355-99.000.

Feuring, Kurt: *See*—
Popp, Franz-Wolfgang; and Feuring, Kurt, 4,572,959, Cl. 250-506.100.

Fidi, Werner; and Richter, Friedrich, to AKG Akustische u.Kino-Gerate Gesellschaft mbH. Ear piece construction. 4,572,324, Cl. 181-129.000.

Fiedler, Hans, to Karl Mayer Textilmaschinenfabrik GmbH. Warp knitting machine with weft thread magazine. 4,571,956, Cl. 66-84.00A.

Fiedler, Marc F., to Topazon Limited. Trigger to activate aqueous salt solution for use in a heat pack and method of making the same. 4,572,158, Cl. 126-263.000.

Fields, Kevin L.: *See*—
Calhoun, Gregory L.; Brunner, Michael G.; and Fields, Kevin L., 4,571,802, Cl. 29-157.30R.

Filipiev, Oleg V.: *See*—
Ioshpa, Vladimir G.; Kirievsky, Boris A.; Kravchenko, Anatoly P.; Kudinov, Gennady A.; Kutsykovich, Dorina B.; Lysenko, Evgeny E.; Shokul, Anatoly A.; Nekrasov, Ignaty N.; Filipiev, Oleg V.; and Lugansky, Vladimir P., 4,572,269, Cl. 164-93.000.

Film-Gerate-Verieith Schmidle & Fritz: *See*—
Haberl, Karl; and Resch, Klaus, 4,572,479, Cl. 254-2.00R.

Finnegan, Gary. Drip free caulking gun. 4,572,409, Cl. 222-391.000.

Firestone Tire & Rubber Company, The: *See*—
Still, Donald O.; and Hovance, Hubert T., 4,572,046, Cl. 83-171.000.

Fischell, Robert E., to Johns Hopkins University, The. Manually actuated hydraulic sphincter. 4,571,749, Cl. 623-14.000.

Fischell, Robert E. Fully implantable vapor pressure actuated penile erection device and method. 4,572,168, Cl. 128-79.000.

Fischer, Artur. Expansible wall plug. 4,572,708, Cl. 411-22.000.

Fischer, Thomas, to Tecnomara AG. Petri dish imprinting apparatus. 4,572,067, Cl. 101-7.000.

Fischhaber, Nikolaus; and Ronge, Johann. Collapsible table structure with interconnected bench seats. 4,572,574, Cl. 297-159.000.

Fishburne, Francis B. Method and apparatus for packing tobacco. 4,572,065, Cl. 100-35.000.

Fisher, Richard G.: *See*—
Barton, William M., Jr.; Murphy, John F.; Offerman, Karl B.; and Fisher, Richard G., 4,573,091, Cl. 360-93.000.

Fitzky, Hans G.: *See*—
Ebneth, Harold; Fitzky, Hans G.; Wolf, Gerhard D.; and Giesecke, Henning, 4,572,960, Cl. 250-516.100.

Fitzpatrick, Brian E.: *See*—
Bednar, Gregory M.; Fitzpatrick, Brian E.; Harmon, John C.; and Narasimha, Manthri S. I., 4,573,200, Cl. 382-47.000.

Fitzpatrick, Brian J., to North American Philips Corporation. Blue luminescent cathode ray tube device with improved color filtering system. 4,572,984, Cl. 313-467.000.

Fleming, Gunter; Grothe, Horst; Haselhuhn, Rolf; and Kaiser, Hans-Peter, to SMS Concast Inc. Arrangement for remote adjustment of the dimensions of a strand during continuous casting. 4,572,277, Cl. 164-436.000.

Flemings, Merton C.; and Lux, Andrew L., to Massachusetts Institute of Technology. Process for purifying metal compositions. 4,572,818, Cl. 420-590.000.

Flemmert, Gosta. Process for preparing finely-divided silicon dioxide in good yield. 4,572,827, Cl. 423-336.000.

Fletcher-Terry Company: *See*—
Miffitt, Roger G., 4,571,828, Cl. 30-123.300.

Fluorocarbon Company, The: *See—*
Hunt, James R.; and Balent, Russell P., 4,571,850, Cl. 34-242.000.

Flynn, Stephen D. Multi-mode demand valve. 4,572,175, Cl. 128-203.110.

Fockens, Tallienco W. H., to N.V. Nederlandsche Apparatenfabriek Nedap. Transponder for electromagnetic detection system with non-linear circuit. 4,572,976, Cl. 307-524.000.

Foley, Geoffrey M. T.; and Hewitt, Harvey J., to Xerox Corporation. Electrophotographic imaging member with charge injection layer. 4,572,883, Cl. 430-58.000.

Fontaine, William G., to Fail Safe Brake Corporation. Automatic vehicle braking system. 4,572,319, Cl. 180-273.000.

Fontana, Ludovico, to Tecnovar Italiana S.p.A. Hanging device to a transport means, with facilitated hooking and automatic release. 4,572,563, Cl. 294-82.240.

Fontlladosa, Enrique B., to Uniconfis Corporation. Display system for consumer fluid product containers. 4,572,361, Cl. 206-45.190.

Foote, John S.: *See—*
Greene, Richard E.; Young, Gladstone F.; Tom, Gary E.; Schaffer, Harry G.; and Foote, John S., 4,573,152, Cl. 371-22.000.

Ford Motor Company: *See—*
Morris, Robert L., 4,572,127, Cl. 123-339.000.
Niederprum, Klaus, 4,572,382, Cl. 211-150.000.

Ford, Thomas M. Compact personal roller. 4,571,769, Cl. 15-230.110.

Forde, John C.: *See—*
Boothman, David R.; and Forde, John C., 4,573,132, Cl. 364-557.000.

Forestal, Richard F. Mounting for signboard. 4,571,868, Cl. 40-590.000.

Forrer, Hans. Device for joining wooden or metallic structural parts. 4,572,491, Cl. 269-43.000.

Forsberg, Jerold M.: *See—*
Swick, Edwin G.; and Forsberg, Jerold M., 4,572,717, Cl. 411-11.000.

Forsogsanleg Riso: *See—*
Hanson, Vagn S. G., 4,572,664, Cl. 356-28.500.

Forster, Josef: *See—*
Katscher, Erich; Stoss, Johannes; Weber, Robert; Zoberlein, Dieter; Weber, Jakob; and Forster, Josef, 4,572,284, Cl. 165-95.000.

Fortuna, Vincent E., to Vercon, Inc. Bi-axially oriented, thin-walled, synthetic plastic container/article. 4,572,851, Cl. 428-35.000.

Foshee, William R., to Best Lock Corporation. Mortise lock. 4,572,556, Cl. 292-165.000.

Foss, Robert M.; and Severson, Gerald R., to Motorola, Inc. Method of hermetically sealing electronic packages. 4,572,846, Cl. 427-237.000.

Foster-Boyd, Inc.: *See—*
Hursh, David F.; and de Irureta-Goyena, Anthony, 4,571,960, Cl. 66-196.000.

Foster, Leslie W., to Outboard Marine Corporation. Engine including means for retarding sparking operation to control engine overspeed. 4,572,150, Cl. 123-602.000.

Foundation: The Research Institute of Electric and Magnetic Alloys, The: *See—*
Masumoto, Hakaru; and Murakami, Yuetsu, 4,572,750, Cl. 148-31.550.

Fowler, Pat; and Woods, Ernest C., Jr., to Zehntel, Inc. Printed circuit board test fixture with flexion means for providing registration between the test probes and the circuit board. 4,573,009, Cl. 324-158.00F.

France Bed Co., Ltd.: *See—*
Sasaki, Noboru; Mukai, Teruo; and Iwata, Yasuji, 4,571,759, Cl. 5-90.000.

France, Michael; and Booth, Rodney, to Case Poclain Corporation Ltd. Mechanism for enabling a vehicle bonnet to be opened and closed. 4,572,312, Cl. 180-69.210.

Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H.: *See—*
Theurer, Josef, 4,572,079, Cl. 104-7.00B.

Franz, Reinhard; Dittmar, Wilfried; Scheidegger, Christian; and Frohlich, Roland, to Franz, Reinhard. Electronic musical instrument. 4,572,048, Cl. 84-1.190.

Fraser, Gregory A.; and Raab, Simon, to Orthotronics Limited Partnership. Knee laxity evaluator and motion module/digitizer arrangement. 4,571,834, Cl. 33-1.0PT.

Freckleton, Howard O.; and Bird, John S. Gas operated smoothing iron. 4,571,863, Cl. 38-86.000.

Frederick, Carlton, to Wolfdata, Inc. Digital modem with plural microprocessors. 4,573,166, Cl. 375-9.000.

Fredrickson, Lee R., to Rockwell International Corporation. Interferometric piezoelectric change of state monitor. 4,572,670, Cl. 356-363.000.

Freedman, Larry A.: *See—*
Rentsch, Edward M.; and Freedman, Larry A., 4,573,078, Cl. 358-213.000.

Freeman, Michael J., to ACTV Inc. Method for expanding interactive CATV displayable choices for a given channel capacity. 4,573,072, Cl. 358-86.000.

Frenken, Hans: *See—*
Koepke, Gunther; Frenken, Hans; Bussmann, Heinrich; and Browatzki, Kurt, 4,572,849, Cl. 427-402.000.

Fricker, Siegfried. Overhead anchoring track. 4,571,912, Cl. 52-710.000.

Frieling, Focko; and Michael, Ewald, to Siemens Aktiengesellschaft. Signal-level converter. 4,572,974, Cl. 307-475.000.

Frietsch, Kurt, to LUK Lamellen und Kupplungsbau GmbH. Clutch plate. 4,572,345, Cl. 192-106.200.

Frisbee, Claude M., to J. I. Case Company. Hose clamp assembly with cable support. 4,572,302, Cl. 172-813.000.

Fritz, Robert J., to United States of America, Energy. Sidetone generator flowmeter. 4,572,003, Cl. 73-861.180.

Frohlich, Roland: *See—*
Franz, Reinhard; Dittmar, Wilfried; Scheidegger, Christian; and Frohlich, Roland, 4,572,048, Cl. 84-1.190.

Fromman, Klaus: *See—*
Michel, Rolf; and Fromman, Klaus, 4,572,099, Cl. 118-68.000.

Fry, Francis J.: *See—*
Schroeder, Eugene; and Fry, Francis J., 4,572,200, Cl. 128-660.000.

Fuderer, Andrija, to Union Carbide Corporation. Ammonia synthesis gas purification. 4,572,829, Cl. 423-359.000.

Fuji Jukogyo Kabushiki Kaisha: *See—*
Suzuki, Takashi; Fukuda, Ryohei; and Takahashi, Kouji, 4,572,714, Cl. 408-230.000.

Fuji Kagakushi Kogyo Co., Ltd.: *See—*
Sato, Tadao; and Shimazaki, Yoshikazu, 4,572,684, Cl. 400-240.400.

Fuji Oil Co., Ltd.: *See—*
Iwayama, Kazuyoshi; Inoue, Takehisa; Sato, Kimio; Hayakawa, Norio; and Fujii, Masaki, 4,572,779, Cl. 208-111.000.

Fuji Photo Film Co., Ltd.: *See—*
Aagano, Toshitaka; and Takasaki, Yoshimi, 4,573,159, Cl. 372-34.000.
Asao, Yasuzi, 4,572,893, Cl. 430-532.000.
Imai, Masanori; and Kanzaki, Hisao, 4,572,889, Cl. 430-302.000.
Maeda, Minoru; Iwasaki, Masayuki; and Shinozaki, Fumiaki, 4,572,888, Cl. 430-288.000.
Takahashi, Michihiko; Saito, Eiichi; and Okano, Takeshi, 4,572,649, Cl. 355-3.00R.
Teraoka, Masanori; Matsuda, Terumi; and Yamazaki, Hisashi, 4,572,955, Cl. 250-483.100.
Tisue, Gil; and Kondo, Ryuji, 4,573,076, Cl. 358-212.000.

Fuji Photo Optical Co., Ltd.: *See—*
Yoshida, Morihiko; and Cooper, David H., 4,572,164, Cl. 128-6.000.

Fujii, Haruo; Sakemi, Yuji; and Toyono, Tsutomu, to Canon Kabushiki Kaisha. Image recording apparatus. 4,573,061, Cl. 346-153.100.

Fujii, Masaki: *See—*
Iwayama, Kazuyoshi; Inoue, Takehisa; Sato, Kimio; Hayakawa, Norio; and Fujii, Masaki, 4,572,779, Cl. 208-111.000.

Fujii, Masao; Nakao, Kazushige; and Tetsuno, Haruo, to Mitsubishi Denki Kabushiki Kaisha. Boiling cooling apparatus. 4,572,286, Cl. 165-104.290.

Fujii, Noritsugu; and Nishimura, Toshimitsu, to Kabushiki Kaisha Kobe Seiko Sho. Pipe leak detector. 4,571,986, Cl. 73-49.100.

Fujimura, Fumio: *See—*
Satake, Toshimi; Minami, Toshiaki; Fujimura, Fumio; Oda, Satoshi; and Magami, Masato, 4,573,062, Cl. 346-209.000.

Fujisoku Electric Co., Ltd.: *See—*
Yamanobe, Ken; Arai, Hiroyuki; and Kasai, Touru, 4,572,997, Cl. 318-349.000.

Fujita, Mamoru; and Kameta, Yasuaki, to Bridgestone Tire Company Limited. Conveyor belt. 4,572,359, Cl. 198-819.000.

Fujitsu Limited: *See—*
Aoyama, Keizo; Yamauchi, Takahiko; and Seki, Teruo, 4,573,147, Cl. 365-230.000.
Nakamura, Hiroshi; Fukuda, Eisuke; and Sasaki, Susumu, 4,573,153, Cl. 371-22.000.
Takemae, Yoshihiro; and Suzuki, Yasuo, 4,572,977, Cl. 307-530.000.

Fujiyama, Kunio: *See—*
Yoshikawa, Noriyuki; and Fujiyama, Kunio, 4,572,573, Cl. 297-75.000.

Fukuda, Eisuke: *See—*
Nakamura, Hiroshi; Fukuda, Eisuke; and Sasaki, Susumu, 4,573,153, Cl. 371-22.000.

Fukuda, Kazushige: *See—*
Matano, Taiji; Ueno, Haruyuki; and Fukuda, Kazushige, 4,572,902, Cl. 501-97.000.

Fukuda, Masaki: *See—*
Takagi, Sadaaki; Yura, Shigetsugu; and Fukuda, Masaki, 4,572,430, Cl. 237-2.00A.

Fukuda, Ryohei: *See—*
Suzuki, Takashi; Fukuda, Ryohei; and Takahashi, Kouji, 4,572,714, Cl. 408-230.000.

Fukuoka, Masayuki; and Matsumoto, Satoshi, to Sakazaki Machinery Works Co., Ltd. Automatic tool changing apparatus for multi-spindle machine tool. 4,571,813, Cl. 29-568.000.

Fukuroi, Takeo, to Nippon Notion Kogyo Co., Ltd. Button having attachment tack deformed by anvil. 4,571,780, Cl. 24-95.000.

Funatani, Kiyoshi; Donomoto, Tadashi; Tanaka, Atsuo; and Tatematsu, Yoshiaki, to Toyota Jidosha Kabushiki Kaisha. Method and apparatus for manufacturing composite material using pressure chamber and casting chamber. 4,572,270, Cl. 164-97.000.

Funke, Herbert, to Saphirwerk Industrieprodukte AG. Plunger or floating piston pump. 4,572,056, Cl. 92-86.000.

Furomoto, Yoshiyuki, to Shimano Industrial Company Limited. Fishing reel. 4,572,454, Cl. 242-84.52B.

Furutsu, Akira, to Japan Bano'k Co., Ltd.; and Ben Clements & Sons, Inc. Tying device. 4,571,787, Cl. 24-543.000.

Furuya, Katusuke; and Sakurai, Tomonari, to Laurel Bank Machine Co., Ltd. Coin checking device for use in a coin handling machine. 4,572,349, Cl. 194-318.000.

Fushiki, Yasuo; Abe, Masaharu; and Oizumi, Masayuki, to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha. Electrical laminate comprising a plurality of fibrous layers and cured resin layers. 4,572,859, Cl. 428-215.000.

G. Bopp & Co. AG: *See—*
Bopp, Peter, 4,571,864, Cl. 38-102.500.

Gach, Peter P., to Sunbeam Plastics Corporation. Tamper indicating screw cap with satellite ring. 4,572,389, Cl. 215-253.000.
Gachsay, Lorant, to Sulzer Brothers Limited. Electrothermal fabric melt cutter for a weaving machine. 4,572,245, Cl. 139-291.00C.
Gainey, Bobby C.: *See—*
Gainey, John M., 4,572,559, Cl. 294-1.100.
Gainey, John M., to Gainey, Bobby C., a part interest. Scoop for gathering leaves, grass, debris and the like. 4,572,559, Cl. 294-1.100.
Gaisch, Helmut; and Nyffeler, Urs, to Fabriques de Tabac Reunies S.A. Process for improving tobacco. 4,572,219, Cl. 131-308.000.
Gaiser, Robert F., to Allied Corporation. Tandem brake booster with hydraulic mechanism for rear diaphragm force reversal. 4,571,943, Cl. 60-560.000.
Galin, Robert, to Intel Corporation. Collision detection method using CRC code. 4,573,045, Cl. 340-825.500.
Gambhirwala, Manoj C.: *See—*
Wolski, Adam M.; Cheng, Chintsai T.; Simon, Richard B.; and Gambhirwala, Manoj C., 4,572,768, Cl. 204-15.000.
Gammel, John C.: *See—*
Becke, Hans W.; Gammel, John C.; Hartman, Adrian R.; Shibib, Muhammed A.; and Smith, Robert K., 4,573,065, Cl. 357-38.000.
Ganesan, Apparajan; and Morrison, Ronald A., to AT&T Bell Laboratories. CMOS Circuit overvoltage protection. 4,573,099, Cl. 361-56.000.
Ganin, Alexander: *See—*
Inbar, Dan; and Ganin, Alexander, 4,573,122, Cl. 364-414.000.
Ganshirt, Karlheinz: *See—*
Walker, Wolfram H.; and Ganshirt, Karlheinz, 4,572,899, Cl. 436-18.000.
Ganssle, Robert; Hoffman, Ernest G.; and Neuroth, David H., to Harvey Hubbell Incorporated. Armored electrical cable with lead sheath. 4,572,926, Cl. 174-103.000.
Gardena Kress & Kastner GmbH: *See—*
Katzer, Johann; Lopic, Franz; Sauer, Roland; and Stephany, Christian, 4,572,235, Cl. 137-268.000.
Gardner, Philip D.; Combe, Robin H.; Groom, John H.; and Groom, Kenneth J. Apparatus for removing liquid from the ground. 4,571,849, Cl. 34-79.000.
Garman, L. David: *See—*
Smith, Ronald J.; Garman, L. David; and Reynolds, W. Evans, 4,572,372, Cl. 206-511.000.
Garniewicz, Charles A.: *See—*
Greis, Howard A.; and Garniewicz, Charles A., 4,571,972, Cl. 72-98.000.
Gartland, Robert J.; and Feil, Joseph N., to Goodyear Tire & Rubber Company, The. Thermoforming partially crystalline polyester articles. 4,572,852, Cl. 428-35.000.
Gaudet, James L.; Lineman, Harry L.; Chukran, Rudolph E.; Neuman, Grover H.; and Barnes, Johnny G., to International Business Machines Corp. Justifying with printer level data stream which accommodates footers and headers. 4,573,138, Cl. 364-900.000.
Gautschi Electro-Fours SA: *See—*
Engelberg, Franz; Fabris, Luciano; Schneider, Robert; Villinger, Gerhard; and Truninger, Walter, 4,572,485, Cl. 266-227.000.
Gazard, Maryse: *See—*
Gombert, Jean; Blaison, Serge; Quinty, Christian; and Gazard, Maryse, 4,572,840, Cl. 427-36.000.
Geary, Carl H.: *See—*
Greene, Kenneth H.; and Geary, Carl H., 4,572,663, Cl. 356-23.000.
Gebhardt Fordertechnik GmbH: *See—*
Felder, Christian, 4,572,353, Cl. 198-577.000.
Gebruder Lodige Maschinenbau-Gesellschaft mbH: *See—*
Schluter, Wilhelm, 4,572,100, Cl. 118-303.000.
Gebruder Marklin & Cie. Gesellschaft mit beschrankter Haftung: *See—*
Hanschke, Christoph; and Mayer, Roland, 4,572,996, Cl. 318-341.000.
Geddes, Leslie A.; and Grubbs, David S., to Purdue Research Foundation. Method and apparatus for measuring cardiac output. 4,572,206, Cl. 128-692.000.
Gee, Randall C., to Industrial Solar Technology. Method for making a solar concentrator and product. 4,571,812, Cl. 29-445.000.
Gehl Company: *See—*
Seefeld, Dean E., 4,572,712, Cl. 406-101.000.
Geiger, Diethard: *See—*
Eisermann, Armin; ten Eicken, Heinz; Obenluneschloss, Kurt; and Geiger, Diethard, 4,572,348, Cl. 194-248.000.
Geissler, Ulrich, to Hoechst Aktiengesellschaft. Radiation-polymerizable mixture with crosslinkable binder. 4,572,887, Cl. 430-288.000.
Geldner, Siegfried. Flange connector. 4,572,553, Cl. 285-363.000.
Gelles, David S.: *See—*
Korenko, Michael K.; Gelles, David S.; and Thomas, Larry E., 4,572,738, Cl. 75-128.00Z.
Gembinski, John C., to Ex-Cell-O Corporation. Composite molded article and process using self-positioning laminated stiffener. 4,572,856, Cl. 428-71.000.
Genco, Louis V.: *See—*
Task, Harry L.; and Genco, Louis V., 4,572,630, Cl. 351-243.000.
Genentech, Inc.: *See—*
Zeikus, Joseph G., 4,572,898, Cl. 435-200.000.
General Dynamics Pomona Division: *See—*
Golden, Michael D., 4,572,351, Cl. 198-412.000.
General Electric Company: *See—*
Anderson, James M.; Schultz, William R., Jr.; VanSchaick, Thomas E.; and Anderson, Frank E., Jr., 4,572,980, Cl. 310-214.000.
Baliga, Bantval J.; and Love, Robert P., 4,571,815, Cl. 29-571.000.
Bianchi, Julio J., 4,572,945, Cl. 235-144.0SP.
Bisson, Donald K.; and Nardin, Steven A., 4,573,012, Cl. 324-222.000.
Bonivich, Paul E., 4,573,139, Cl. 364-900.000.
Campbell, Michael E., 4,571,841, Cl. 33-185.00R.
Cipolla, Thomas M., 4,572,564, Cl. 294-88.000.
Corby, Nelson R., Jr., 4,573,073, Cl. 358-96.000.
Cote , Paul T., 4,572,991, Cl. 315-240.000.
Farrall, George A., 4,572,982, Cl. 313-348.000.
Hickey, John S., 4,573,032, Cl. 337-162.000.
Kim, Bang M., 4,572,824, Cl. 423-70.000.
LeBlanc, Oliver H., Jr., 4,572,810, Cl. 264-0.500.
Lounsberry, Brian D.; and Meade, Robert W., 4,573,185, Cl. 378-125.000.
Noe, Raymond J., 4,572,730, Cl. 65-67.000.
Relihan, Gary F., 4,573,183, Cl. 378-108.000.
Sehgal, Tyag R., 4,572,677, Cl. 374-144.000.
Simon, Francois Y., 4,573,141, Cl. 364-900.000.
General Foods Corporation: *See—*
Zanno, Paul R.; Barnett, Ronald E.; and Roy, Glenn M., 4,572,799, Cl. 260-112.50R.
General Hospital Corporation, The: *See—*
Moore, Richard H.; Strauss, H. William; and Alpert, Nathaniel M., 4,572,197, Cl. 128-644.000.
General Motors Corporation: *See—*
Brown, Trevor J., 4,572,584, Cl. 301-37.0TP.
Chupick, Ronald, 4,572,558, Cl. 293-128.000.
Daugherty, James D., 4,572,878, Cl. 429-62.000.
Deckard, John I., 4,572,433, Cl. 239-88.000.
HaBmann, Franz, 4,572,569, Cl. 296-65.00R.
Hutchins, Bruce E., 4,572,326, Cl. 181-150.000.
Malen, Donald E., 4,572,571, Cl. 296-197.000.
Rees, Richard W. A., 4,572,469, Cl. 248-430.000.
Stettner, Ernest R.; Cianfichi, Kenneth P.; and Stoltman, Donald D., 4,572,436, Cl. 239-585.000.
Symons, James D.; Dershem, Ronald J.; and DeHart, Arnold O., 4,572,516, Cl. 277-50.000.
General Propeller Company: *See—*
Rauch, George W., 4,572,698, Cl. 403-356.000.
General Signal Corporation: *See—*
Stevens, Stanley J.; and Hoffman, Jeffrey G., 4,572,718, Cl. 411-107.000.
Stock, Arthur J.; Christofer, Donald E.; Homer, John C.; Torok, Robert J.; and Whittington, Thomas, 4,572,710, Cl. 414-146.000.
Geoffrey Ashton Pty. Ltd.: *See—*
Ashton, Geoffrey B., 4,571,906, Cl. 52-239.000.
Georg Fischer Aktiengesellschaft: *See—*
Zimmermann, Rainer, 4,572,274, Cl. 164-169.000.
Georg Muller Kugellager-Fabrik K.G.: *See—*
Feldmeier, Fritz; and Hafner, Gregor, 4,572,525, Cl. 279-1.00C.
Georg Rost & Sohne Armaturenfabrik GmbH & Co Kg: *See—*
Strangfeld, Reiner, 4,571,753, Cl. 4-324.000.
George A. Hovanec, Jr.: *See—*
Smaw, Jesse, 4,571,874, Cl. 43-4.500.
Gerber Garment Technology, Inc.: *See—*
Pearl, David R., 4,572,357, Cl. 198-693.000.
Gerfast, Sten R., to Minnesota Mining and Manufacturing Company. Clam-shell cartridge for recording disc. 4,573,096, Cl. 360-133.000.
Gervais, Pierre P.; and Simon, Bernard, to L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude. Container having a high degree of thermal insulation. 4,572,402, Cl. 220-465.000.
Gessner, James D.: *See—*
Mueller, Thomas D.; and Gessner, James D., 4,572,229, Cl. 137-99.000.
Gewerkschaft Eisenhutte Westfalia: *See—*
Weirich, Walter; and Dettmers, Michael, 4,572,709, Cl. 405-302.000.
Ghiaro, Fiorenzo, to ROJ Electrotex S.p.A. Weft yarn presenting device for looms. 4,572,246, Cl. 139-435.000.
Ghielmetti, Giuseppe; Casale, Liborio; and Donelli, Giordano, to Caffaro S.p.A. Process for the continuous production of tetrachlorophthalo-nitrile in two reactors in series. 4,572,806, Cl. 260-465.00G.
Gibeau, Frank C.; and Farmer, Paul L., to Atasi Corporation. Moving magnet disc drive actuator. 4,573,094, Cl. 360-106.000.
Giesecke, Henning: *See—*
Ebneth, Harold; Fitzky, Hans G.; Wolf, Gerhard D.; and Giesecke, Henning, 4,572,960, Cl. 250-516.100.
Giesecke, Peter; and Feith, Johann, to Carl Schenck AG, Firma. Method for constructing a weighbridge and weighing cell assembly, in particular for use in performing the method. 4,572,308, Cl. 177-1.000.
Gilb, Tyrell T., to Simpson Strong-Tie Company, Inc. Six finger wood jointing connector. 4,572,695, Cl. 403-232.100.
Gilbert Associates, Inc.: *See—*
Smith, Ronald J.; Garman, L. David; and Reynolds, W. Evans, 4,572,372, Cl. 206-511.000.
Gilbert, James F.: *See—*
Meuwly, Michael S.; Roberts, James A.; Gilbert, James F.; Clavert, Daniel V.; and Green, James B. P., Jr., 4,571,916, Cl. 53-48.000.
Givaudan Corporation: *See—*
Kaiser, Roman; and Lamparsky, Dietmar, 4,572,795, Cl. 252-522.00R.
Gjertsen, Robert K.; Wilson, John F.; and Shallenberger, John M., to Westinghouse Electric Corp. Reconstituting a nuclear reactor fuel assembly. 4,572,816, Cl. 376-261.000.

GKN Automotive Components, Inc.: *See*—
Emerson, Richard, 4,572,749, Cl. 148-16.500.
Gladson Limited: *See*—
Lack, Andrew J., 4,573,109, Cl. 362-194.000.
Gladstone, Robert S., to Coopers Filters Limited. Air filtration. 4,572,147, Cl. 123-556.000.
Gluck, David G.; DeLeon, Alberto; and Oliver, John P., to Celotex Corporation, The. Faced foam insulation board and froth-foaming method for making same. 4,572,865, Cl. 428-309.900.
Gnutzmans, Ozias A., to Combustol Industria e Comercio Ltda. Support for electrical resistances of ovens or kilns with ceramic mantle thermal insulation. 4,573,164, Cl. 373-130.000.
Godin, Norman: *See*—
Breakey, Fred B.; Barber, Leo D.; Chapman, Richard L.; Godin, Norman; Henry, Robert; Jackson, Claude; Romberger, John; and Seidl, Rudolph, 4,572,381, Cl. 211-94.000.
Golden, Michael D., to General Dynamics Pomona Division. Transfer unit. 4,572,351, Cl. 198-412.000.
Golden, Robert C.; and Neumeyer, Martin J. Bicycle type seat. 4,572,575, Cl. 297-195.000.
Goldman, Jerome N.; Goldman, Marvin A.; and Philips, Gerald A., to Penn Plax Plastics, Inc. Device for cleaning the interior surface of an aquarium. 4,571,766, Cl. 15-105.000.
Goldman, Marvin A.: *See*—
Goldman, Jerome N.; Goldman, Marvin A.; and Philips, Gerald A., 4,571,766, Cl. 15-105.000.
Golman, Klaes: *See*—
Gronberg, Thomas; Almen, Torsten; Golman, Klaes; Mattsson, Soren; and Sjoberg, Staffan, 4,573,181, Cl. 378-45.000.
Gombert, Jean; Blaison, Serge; Quinty, Christian; and Gazard, Maryse, to Thomson-CSF. Method of manufacturing an optical fiber with chiralic structure and a device for putting this method into practice. 4,572,840, Cl. 427-36.000.
Gomez-Sanchez, Abel; Valdes-Neri, Jaime; and Quintero, Miguel H. C., to Vitrocrisa Cristaleria, S.A. Machine for cutting off excess ends of hollow glass, plastic or similar articles. 4,572,732, Cl. 65-271.000.
Gooch, Ian D.; and Thom, Ian G., to Ferranti plc. Photographic film copying apparatus. 4,572,660, Cl. 355-99.000.
Goodin, Jonathan W.; and Irving, Edward, to Ciba-Geigy Corporation. Process for the production of images. 4,572,890, Cl. 430-325.000.
Goodwin, Ray R. Duct-shaping machine and method. 4,571,980, Cl. 72-381.000.
Goodyear Tire & Rubber Company, The: *See*—
Binsfeld, Adrien, 4,572,261, Cl. 152-209.00R.
Chung, Daniel A., 4,572,863, Cl. 428-250.000.
Gartland, Robert J.; and Feil, Joseph N., 4,572,852, Cl. 428-35.000.
Gordon, Eugene I.: *See*—
Anthony, Philip J.; and Gordon, Eugene I., 4,573,156, Cl. 372-19.000.
Gorike, Rudolf. Collapsible headband. 4,571,746, Cl. 2-209.000.
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Kojima, Shuichi; Nakao, Masashi; Gotoh, Miyuki; Ishido, Takao; and Imamura, Shuichiro, 4,572,244, Cl. 139-103.000.
Gould, Sheldon D.; and Riggs, Gary T., to Cordis Corporation. Vessel dilation. 4,572,186, Cl. 128-341.000.
Goulter, Victor H. Method of providing multiplied force using vernier members and pry lever. 4,572,494, Cl. 269-329.000.
Gourmeta, Inc.: *See*—
Bakal, Abraham I., 4,572,836, Cl. 426-321.000.
Grabler, Wolfgang; and Klepsch, Werner, to Deere & Company. O-Ring insertion tool. 4,571,804, Cl. 29-235.000.
Graham, Andrew C.; Proebsting, Robert J.; and Segers, Dennis L., to Mostek Corporation. Testing and evaluation of a semiconductor memory containing redundant memory elements. 4,573,146, Cl. 365-200.000.
Graham, Charles H. Multi-purpose tool. 4,572,038, Cl. 81-439.000.
Graiver, Daniel; and Kalinowski, Robert E., to Dow Corning Corporation. Silicone wear base elastomeric foam. 4,572,917, Cl. 521-68.000.
Granados, Alejandro: *See*—
Krasuk, Julio; Solari, Rodolfo B.; Aquino, Luis G.; Rodriguez, Jose V.; and Granados, Alejandro, 4,572,781, Cl. 208-309.000.
Grandlouis, James. Ash remover. 4,572,560, Cl. 294-55.000.
Graphic Controls Corporation: *See*—
Hubbard, James R.; and Berry, Ronald B., 4,573,060, Cl. 346-140.00A.
Grauel, Christoph; Duplessis, Philippe; and Tarabout, Alain, to U.S. Philips Corporation. Method and means for allocating the volume of traffic over different control channels of a cellular radio system. 4,573,206, Cl. 455-33.000.
Grauli, Siegfried: *See*—
Sellner, Jorg; Siegwart, Rudolf; and Grauli, Siegfried, 4,571,796, Cl. 29-27.00R.
Graver Company, The: *See*—
Kunin, Robert; and Salem, Eli, 4,572,742, Cl. 127-46.200.
Graves, Gene E.: *See*—
Punater, Dinesh G.; and Graves, Gene E., 4,572,047, Cl. 83-481.000.
Grazioli, Angel J., to Cameron Iron Works, Inc. Bidirectional seal with wide temperature range. 4,572,515, Cl. 277-12.000.
Green, Alex E. S.; and Green, Bruce A. S., to University of Florida. Method and apparatus of gas-coal combustion in steam boilers. 4,572,084, Cl. 110-261.000.
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Green, Alex E. S.; and Green, Bruce A. S., 4,572,084, Cl. 110-261.000.
Green, James B. P., Jr.: *See*—
Meuwly, Michael S.; Roberts, James A.; Gilbert, James F.; Clavert, Daniel V.; and Green, James B. P., Jr., 4,571,916, Cl. 53-48.000.
Green, Ronald. Bingo indicator. 4,572,510, Cl. 273-148.00R.
Greenberg, Edmond L.: *See*—
Josephson, Vernal; and Greenberg, Edmond L., 4,572,954, Cl. 250-370.000.
Greene, Kenneth H.; and Geary, Carl H., to Elliott Turbomachinery Co., Inc. Method and apparatus for selectively illuminating a particular blade in a turbomachine. 4,572,663, Cl. 356-23.000.
Greene, Richard E.; Young, Gladstone F.; Tom, Gary E.; Schaffer, Harry G.; and Foote, John S. Switch matrix test and control system. 4,573,152, Cl. 371-22.000.
Greenfield, John B., to Rheem Manufacturing Company. Solar and convection assisted heat pump system. 4,571,952, Cl. 62-235.100.
Gregor, William T.: *See*—
Roth, Richard W.; Gregor, William T.; Sherwood, Michael D.; and Pokrajac, Ned, 4,573,192, Cl. 382-1.000.
Greis, Howard A.; and Garniewicz, Charles A., to Kinefac Corp. Skewed-axis cylindrical die rolling. 4,571,972, Cl. 72-98.000.
Grelan Pharmaceutical Co., Ltd.: *See*—
Kigasawa, Kazuo; Shimizu, Hiroaki; Hayashi, Toshihiro; Watabe, Kazuo; Tanizaki, Akira; Koyama, Osamu; Wakisaka, Kikuo; and Ogawa, Yasuaki, 4,572,832, Cl. 424-19.000.
Grenier, Jean, to Louis Vuitton, S.A. Device for safely holding in position a raised or lowered flap. 4,572,401, Cl. 220-335.000.
Griesshammer, Rudolf: *See*—
Lang, Winfried; Griesshammer, Rudolf; Schwab, Michael; and Zulehner, Werner, 4,572,729, Cl. 65-18.100.
Griffith, Arval H. Combustion gas cleaning system. 4,572,083, Cl. 110-215.000.
Grimaldi, Jean-Luc, to Thomson CSF. Programmable circuit for series-parallel transformation of a digital signal. 4,573,172, Cl. 375-116.000.
Grimm, David F.: *See*—
Henze, Christopher P.; and Grimm, David F., 4,573,168, Cl. 375-36.000.
Grittmann, Gunter. Bung hole closure for cans. 4,572,390, Cl. 217-106.000.
Groff, Gordon S.; and Herr, Dean S., to Herrmidifier Company, Inc. In duct atomizing humidification and evaporative cooling system. 4,572,428, Cl. 236-44.00A.
Gronberg, Thomas; Almen, Torsten; Golman, Klaes; Mattsson, Soren; and Sjoberg, Staffan, to Elementanalys Almen & Gronberg AB. X-Ray fluorescence analyzers. 4,573,181, Cl. 378-45.000.
Gronberg, Torsten R.: *See*—
Orevik, Sune A. W.; and Gronberg, Torsten R., 4,572,552, Cl. 285-253.000.
Groom, John H.: *See*—
Gardner, Philip D.; Combe, Robin H.; Groom, John H.; and Groom, Kenneth J., 4,571,849, Cl. 34-79.000.
Groom, Kenneth J.: *See*—
Gardner, Philip D.; Combe, Robin H.; Groom, John H.; and Groom, Kenneth J., 4,571,849, Cl. 34-79.000.
Grosscurt, Arnoldus C.: *See*—
van Hes, Roelof; and Grosscurt, Arnoldus C., 4,572,914, Cl. 514-403.000.
Groteke, Daniel E.; and Kearney, Avery L., to Metcast Associates, Inc. Molten metal filtering vessel with internal filter. 4,572,486, Cl. 266-229.000.
Grothe, Horst: *See*—
Fleming, Gunter; Grothe, Horst; Haselhuhn, Rolf; and Kaiser, Hans-Peter, 4,572,277, Cl. 164-436.000.
Groult, Emile J. L., to Cofadis S.A. Installation for monitoring and controlling a production machine. 4,573,130, Cl. 364-552.000.
Grubbs, David S.: *See*—
Geddes, Leslie A.; and Grubbs, David S., 4,572,206, Cl. 128-692.000.
Gruber, Walter F. Concealed sanitary valve unit. 4,572,232, Cl. 137-360.000.
Grunbeck Wasseraufbereitung GmbH: *See*—
Arens, Hans, 4,572,397, Cl. 220-270.000.
Gruninger, Gerhard: *See*—
Hinz, Bernhard; and Gruninger, Gerhard, 4,572,058, Cl. 92-187.000.
Grunwald, Werner; Imhof, Ernst; Komaroff, Iwan; Mayer, Rolf; and Schmid, Gunther, to Robert Bosch GmbH. Device for injecting fuel in combustion chambers. 4,572,146, Cl. 123-549.000.
GTE Communication Systems Corporation: *See*—
Huft, John M., 4,572,927, Cl. 179-16.0AA.
GTE Products Corporation: *See*—
Sindlinger, Ronald E., 4,572,986, Cl. 315-74.000.
Guaraldi, Glenn A., to Harris Graphics Corporation. Multi-unit press register. 4,572,074, Cl. 101-426.000.
Guarracini, Joseph; Shepherd, Paul E.; and McQuade, Robert W., to RCA Corporation. Motion transmission system. 4,572,021, Cl. 74-479.000.
Guenthner, Russell W.: *See*—
Ong, Richard H.; Economopoulos, Peter C.; and Guenthner, Russell W., 4,573,116, Cl. 364-200.000.
Guettouche, Ali; and Lodder, Bernhard, to Wavin B.V. Sealing joint and retaining ring for pipe grooved bell and straight spigot joint. 4,572,523, Cl. 277-207.00A.
Guichard, Jean, to Messier-Hispano-Bugatti. System for controlling a brake actuator on a vehicle, particularly an aircraft. 4,572,585, Cl. 303-3.000.

Guillaumot, Jacques, to Commissariat a l'Energie Atomique. Ergonomic helmet means. 4,571,741, Cl. 2-8.000.
Guillerot, Jean C.; Joncour, Hubert; Auvray, Gerard; and Balduzzi, Daniel, to Thomson CSF. Method and device for reducing the power of jamming signals received by the sidelobes of a radar antenna. 4,573,052, Cl. 343-18.00E.
Guitteny, Jean-Louis; Pernod, Roger; Roques, Christian; and Tran Van, Guy, to Unisabi, S.A. Process for the rapid sterilization of partially hydrolyzed animal offal. 4,572,839, Cl. 426-646.000.
Gulf Research & Development Company: *See—*
Onopchenko, Anatoli; and Sabourin, Edward T., 4,572,791, Cl. 252-46.300.
Gunn, Jeffrey W.: *See—*
Roach, Henry P.; and Gunn, Jeffrey W., 4,571,920, Cl. 53-300.000.
Gustmann, Kurt; Brandt, Siegard; and Sourisseaux, Ludwig, to Pfaff Aktiengesellschaft. Freely revolving looper for double lockstitch sewing machines. 4,572,091, Cl. 112-229.000.
Gutbrod-Werke GmbH: *See—*
Klever, Manfred; and Rott, Karl-Heinz, 4,571,861, Cl. 37-241.000.
Gutshall, Charles E. Blank for a thread forming screw. 4,572,875, Cl. 428-585.000.
Haake, Joseph R.: *See—*
Jensen, James W.; and Haake, Joseph R., 4,572,752, Cl. 156-64.000.
Haar, Gerhard; Jakob, Heinz; Prohaska, Hans; Schneider, Theodor; Schubert, Karl-Friedrich; and Wohrle, Werner, to ITT Industries, Inc. Terminal connections and housing for a small electric motor for windshield wiper. 4,572,979, Cl. 310-68.00R.
Haberl, Karl; and Resch, Klaus, to Film-Gerate-Verieith Schmidle & Fritz. Camera truck. 4,572,479, Cl. 254-2.00R.
HaBmann, Franz, to General Motors Corporation. Pivotable back-rest, particularly for the rear bench seats in motor vehicles. 4,572,569, Cl. 296-65.00R.
Habuka, Yoshio: *See—*
Arita, Kishio; Mitani, Susumu; Sakai, Hideo; Sudo, Yoshikazu; Koide, Yoshitaka; Sato, Haruzi; Habuka, Yoshio; Kozakai, Takashi; and Tanaka, Hiroji, 4,571,999, Cl. 73-598.000.
Hachiya, Iwao; and Joyama, Norio, to Meiji Seika Kaisha Ltd. Method for manufacturing deaerated chocolate products. 4,572,835, Cl. 426-306.000.
Haeflich, Jack, to Energy Services Inc. Combined heat recovery and emission control system. 4,572,110, Cl. 122-7.00R.
Haefliger, William W.: *See—*
Pangburn, William E., 4,572,222, Cl. 132-76.400.
Haferl, Peter E., to RCA Corporation. Television deflection circuit with raster width stabilization. 4,572,993, Cl. 315-408.000.
Hafner, Gregor: *See—*
Feldmeier, Fritz; and Hafner, Gregor, 4,572,525, Cl. 279-1.00C.
Hafner, V. Walter: *See—*
Morris, Earl L.; and Hafner, V. Walter, 4,571,901, Cl. 52-106.000.
Hagele, Gerhard, to Henkel Kommanditgesellschaft auf Aktien. Oligophosphonic acids, oligophosphinic acids, and process of preparation. 4,572,807, Cl. 260-932.000.
Haldric, Bernard, to NACAM. Coupling collar produced by a blanking and folding of a blank. 4,572,697, Cl. 403-344.000.
Hale, Thomas G. Tool for magnetically locating and recovering electrical wires. 4,572,561, Cl. 294-65.500.
Halenbeck, Robert F.: *See—*
Koths, Kirston E.; and Halenbeck, Robert F., 4,572,798, Cl. 260-112.00R.
Halgrimson, Edwin A., to Standard Oil Company (Indiana). Supervisory control system for remotely monitoring and controlling at least one operational device. 4,573,115, Cl. 364-138.000.
Hall, David S., to Velodyne Acoustics, Inc. Loudspeaker with high frequency motional feedback. 4,573,189, Cl. 381-96.000.
Haller, Walter, to Swiss Aluminium Ltd. Process for cooling a continuously cast ingot during casting. 4,572,280, Cl. 164-467.000.
Halliburton Company: *See—*
St. Onge, Kenneth J., 4,571,993, Cl. 73-151.000.
Haltof, Garry P., to Caldwell Manufacturing Company. Automatic friction sash holder. 4,571,887, Cl. 49-429.000.
Hamamoto, Takashi: *See—*
Haruta, Masahiro; and Hamamoto, Takashi, 4,572,847, Cl. 427-261.000.
Hampar, Berge; Zweig, Martin; and Showalter, Stephen D., to United States of America, Health and Human Services. Monoclonal antibodies to herpes simplex virus type I polypeptides. 4,572,896, Cl. 435-172.200.
Handa, Shizuo, to Nippondenso Co., Ltd. Fuel injection timing control device. 4,572,144, Cl. 123-501.000.
Handleman Company: *See—*
Morris, William L., 4,572,369, Cl. 206-387.000.
Handler, Howard; and Wilson, Ronald L., to Industrial Design Associates, (IDA). High frequency ballast circuit. 4,572,988, Cl. 315-209.00R.
Hanessian, Stephen: *See—*
Nadzan, Alex M.; Pernet, Andre G.; and Hanessian, Stephen, 4,572,907, Cl. 514-25.000.
Hanna, Marie R.: *See—*
van Loveren, Augustinus G.; Sprecker, Mark A.; Whelan, Patrick; and Hanna, Marie R., 4,572,796, Cl. 252-522.00R.
Hannes, Heinz D.; Lothmann, Josef; and Walther, Ludwig, to Zimmermann & Jansen GmbH. Exact position feedback of double-acting power piston in hydraulic cylinders. 4,572,054, Cl. 91-1.000.
Hans and Fritz Stahlecker: *See—*
Stahlecker, Fritz, 4,571,933, Cl. 57-401.000.
Hans Rinninger u. Sohn GmbH u. Co.: *See—*
Rinninger, Hans J., 4,572,699, Cl. 404-42.000.
Hanschke, Christoph; and Mayer, Roland, to Gebruder Marklin & Cie. Gesellschaft mit beschrankter Haftung. Control unit for model vehicles. 4,572,996, Cl. 318-341.000.
Hanson, Vagn S. G., to Forsogsanleg Riso. Method of measuring velocity gradients in a flowing medium and apparatus for carrying out the method. 4,572,664, Cl. 356-28.500.
Hanyu, Susumu; Koide, Akio; and Kanemaki, Koji, to Janome Sewing Machine Industry Co., Ltd. Snap fit workpiece edge guide for a sewing machine. 4,572,090, Cl. 112-153.000.
Harast, Donald G., to United States of America, Energy. Brazing technique. 4,572,939, Cl. 219-85.00M.
Harder, Helmut, to Thyssen Industrie Aktiengesellschaft. Movable carrier for supply lines placed along a telescoping airplane passenger bridge. 4,572,550, Cl. 285-47.000.
Harigaya, Isao; and Tamamura, Hideo, to Canon Kabushiki Kaisha. Photographing operation control device for camera. 4,572,640, Cl. 354-400.000.
Harmer, Alan L., to Battelle Memorial Institute. Fiber-optical pressure detector. 4,572,950, Cl. 250-227.000.
Harmon, John C.: *See—*
Bednar, Gregory M.; Fitzpatrick, Brian E.; Harmon, John C.; and Narasimha, Manthri S. I., 4,573,200, Cl. 382-47.000.
Harries, David A.: *See—*
Cunningham, Douglas J.; Else, Robert F.; and Harries, David A., 4,572,544, Cl. 280-808.000.
Harris Corporation: *See—*
Mefford, Joseph P., 4,573,007, Cl. 324-133.000.
Harris Graphics Corporation: *See—*
Guaraldi, Glenn A., 4,572,074, Cl. 101-426.000.
Punater, Dinesh G.; and Graves, Gene E., 4,572,047, Cl. 83-481.000.
Hartel, Volker; and Hofmann, Manfred, to Metzeler Kautschuk GmbH. Apparatus for determining the fatigue limit of elastic material under completely reversed stress. 4,572,002, Cl. 73-809.000.
Hartig, Klaus: *See—*
Dietrich, Anton; Hartig, Klaus; and Scherer, Michael, 4,572,842, Cl. 427-39.000.
Harting Elektronik GmbH: *See—*
Josuttis, Horst; Meierkord, Ralf; and Welsch, Hans-Jurgen, 4,572,216, Cl. 131-70.000.
Hartman, Adrian R.: *See—*
Becke, Hans W.; Gammel, John C.; Hartman, Adrian R.; Shibib, Muhammed A.; and Smith, Robert K., 4,573,065, Cl. 357-38.000.
Haruta, Masahiro; and Hamamoto, Takashi, to Canon Kabushiki Kaisha. Process for recording with ink on a material comprising a substrate having thereon a coating layer with micro-cracks. 4,572,847, Cl. 427-261.000.
Harvey Hubbell Incorporated: *See—*
Ganssle, Robert; Hoffman, Ernest G.; and Neuroth, David H., 4,572,926, Cl. 174-103.000.
Hasegawa, Kazou: *See—*
Yoshioka, Takao; Kitazawa, Eiici; Kurumada, Tomoyuki; Yamazaki, Mitsuo; and Hasegawa, Kazou, 4,572,912, Cl. 514-369.000.
Hasegawa, Shumpei; Mishima, Yoshibumi; Kishi, Noriyuki; and Makino, Yuzi, to Honda Giken Kogyo K.K. Method of controlling intake air quantity for internal combustion engines. 4,572,141, Cl. 123-339.000.
Hasegawa, Shumpei; Shiraiwa, Michitaka; and Tsuchiya, Sadatomo, to Honda Giken Kogyo Kabushiki Kaisha. Air/fuel ratio control system for an internal combustion engine. 4,572,149, Cl. 123-589.000.
Hasegawa, Shumpei: *See—*
Umesaki, Shigeo; and Hasegawa, Shumpei, 4,572,143, Cl. 123-479.000.
Hasegawa, Yutaka: *See—*
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Haselhuhn, Rolf: *See—*
Fleming, Gunter; Grothe, Horst; Haselhuhn, Rolf; and Kaiser, Hans-Peter, 4,572,277, Cl. 164-436.000.
Hashimoto, Akihiko: *See—*
Yoshida, Yoichi; Hashimoto, Akihiko; Suzuki, Tatsuya; Shirai, Hitoshi; Akitake, Hiroshi; and Nakazawa, Hirotsugu, 4,572,645, Cl. 354-435.000.
Hashimoto, Haruo; and Ono, Toyoichi, to Kabushiki Kaisha Komatsu Seisakusho. Governor device of diesel engine. 4,572,131, Cl. 123-357.000.
Hashimura, Etsuro: *See—*
Shimizu, Fumio; Tachikawa, Tetsuya; Ikei, Nobuhiro; Noda, Atunari; Hashimura, Etsuro; and Imagawa, Kenichi, 4,572,800, Cl. 260-112.50R.
Hashiyama, Hideshi; Araki, Shuichi; and Ogura, Michio, to Dainippon Screen Seizo Kabushiki Kaisha. Data processing method of binary graphic pattern and system therefor. 4,573,201, Cl. 382-56.000.
Hatanaka, Akiko: *See—*
Ikeya, Hirotoshi; Suzuki, Shuichi; Oguni, Takayuki; Matsumoto, Kazutaka; and Hatanaka, Akiko, 4,572,853, Cl. 428-76.000.
Hathaway, Steven: *See—*
Lindley, Michael G.; and Hathaway, Steven, 4,572,916, Cl. 514-777.000.
Hattori, Takashi; and Otsuka, Tadao, to Hitachi Metals, Ltd. Coupler for connecting trailer to tractor. 4,572,537, Cl. 280-433.000.
Hausinger, Otto, to Dr. Ing. h.c.F. Porsche Aktiengesellschaft. Vehicle transmission arrangement. 4,572,018, Cl. 74-397.000.

Haven, Kenneth R., to Hewlett-Packard Company. Removable display screen bezel. 4,572,592, Cl. 312-7.200.
Havens, Donald P., to Rockwell International Corporation. Mechanical filter apparatus having interchanged resonator means for improved coupling of bridging wires. 4,573,028, Cl. 333-198.000.
Havens, H. Norris: *See*—
Parsons, Albert; and Havens, H. Norris, 4,572,701, Cl. 404-50.000.
Hayakawa, Norio: *See*—
Iwayama, Kazuyoshi; Inoue, Takehisa; Sato, Kimio; Hayakawa, Norio; and Fujii, Masaki, 4,572,779, Cl. 208-111.000.
Hayashi, Mikio, to Seikosha Co., Ltd. Structure for mounting an ink ribbon cassette on a printer carriage. 4,572,683, Cl. 400-208.000.
Hayashi, Toshihiro: *See*—
Kigasawa, Kazuo; Shimizu, Hiroaki; Hayashi, Toshihiro; Watabe, Kazuo; Tanizaki, Akira; Koyama, Osamu; Wakisaka, Kikuo; and Ogawa, Yasuaki, 4,572,832, Cl. 424-19.000.
Hayashi, Yoriyuki: *See*—
Takase, Tsuneyoshi; and Hayashi, Yoriyuki, 4,572,178, Cl. 128-205.270.
Hayashi, Yoshimasa, to Nissan Motor Co., Ltd. Parts-arrangement in boiling liquid cooling system. 4,572,115, Cl. 123-41.210.
Hayashibara, Ken: *See*—
Masaki, Kazumi, 4,572,992, Cl. 315-310.000.
Haynes, James T.: *See*—
Buchalter, Michael S.; Hopwood, Francis W.; and Haynes, James T., 4,573,027, Cl. 333-17.00R.
Hayward, John J. P. Access structure for use in trapping flying insects, and fly trap including such structure. 4,571,880, Cl. 43-122.000.
Hazeltine Corporation: *See*—
Bruengger, Craig V., 4,571,788, Cl. 24-602.000.
Head, Edwin L. Device for therapy of the human or animal body. 4,572,194, Cl. 128-419.00R.
Headley, James A., to Texaco Inc. Lubrication additive for aqueous drilling fluids. 4,572,790, Cl. 252-8.50A.
Heberlein, Werner: *See*—
Politzer, Anton; Heberlein, Werner; and Konicke, Helmut, 4,572,076, Cl. 102-431.000.
Heck, Joseph P., to Motorola, Inc. Null initiated method and system for monitoring a priority channel. 4,573,210, Cl. 455-166.000.
Hedelin, Lars G. B. Internal combustion engine. 4,572,116, Cl. 123-78.00D.
Heichberger, Albert N. Liquid/gas carbon dioxide evaporator. 4,572,728, Cl. 62-21.000.
Heidelberger Druckmaschinen AG: *See*—
Jeschke, Willi, 4,572,072, Cl. 101-348.000.
Heideman, Robert J.; Holden, Jerry B.; and Crain, Richard W., to Hydra Systems International, Inc. Quick release mount for firearm aiming device. 4,571,870, Cl. 42-1.00A.
Heimann, Edmund: *See*—
Scholz, Erhard; Heimann, Edmund; and Baach, Hans, 4,572,936, Cl. 219-73.200.
Heintzmann, Peter; Koppers, Manfred; Amling, Friedel; and Bohnes, Karlheinz, to Rochumer Eisenhuette Heintzmann GmbH & Co. KG. Hydraulic prop. 4,572,480, Cl. 254-93.00R.
Helene Curtis Industries, Inc.: *See*—
Hsiung, Du Y.; Davis, Chester A.; and Nicholson, Harold J., 4,572,220, Cl. 132-7.000.
Hellegaard, Kjeld; Doktor, Hans; and Jacobsen, Niels O., to Danfoss A/S. Low power loss snubber for switching power transistors. 4,572,969, Cl. 307-254.000.
Helmets Limited: *See*—
Briggs, Michael, 4,571,747, Cl. 2-424.000.
Henderson, Joseph R., Jr. Device used for the tying of a proper bowline knot. 4,572,555, Cl. 289-17.000.
Hendy, John; and Hendy, Vicki L. Melon-slicing apparatus with adjustable guide roller. 4,571,832, Cl. 30-280.000.
Hendy, Vicki L.: *See*—
Hendy, John; and Hendy, Vicki L., 4,571,832, Cl. 30-280.000.
Henke, Arthur W.: *See*—
Hines, Gordon E.; Henke, Arthur W.; and Burzan, Vernon J., 4,571,807, Cl. 29-252.000.
Henke, Klaus: *See*—
Komp, Uwe; Henke, Klaus; and Wozniak, Johannes, 4,572,587, Cl. 305-56.000.
Henkel Kommanditgesellschaft auf Aktien: *See*—
Hagele, Gerhard, 4,572,807, Cl. 260-932.000.
Henry, Robert: *See*—
Breakey, Fred B.; Barber, Leo D.; Chapman, Richard L.; Godin, Norman; Henry, Robert; Jackson, Claude; Romberger, John; and Seidl, Rudolph, 4,572,381, Cl. 211-94.000.
Hentschke, Siegbert; and Schaper, Klaus, to International Standard Electric Corporation. Digital communication system, particularly color television transmission system. 4,573,167, Cl. 375-27.000.
Henze, Christopher P.; and Grimm, David F., to Sperry Corporation. Balanced bidirectional or party line transceiver accommodating common-mode offset voltage. 4,573,168, Cl. 375-36.000.
Hep Products AB: *See*—
Stenlund, Stig, 4,572,238, Cl. 137-625.300.
Hepworth, Malcolm T., to Amax Inc. Coal combustion to produce clean low-sulfur exhaust gas. 4,572,085, Cl. 110-345.000.
Hepworth, Mark N., to Rockwell International Corporation. Activity monitor, power-on clear circuit. 4,572,966, Cl. 307-200.00A.
Her Investments: *See*—
Edens, Robert B., 4,571,854, Cl. 36-50.000.
Herkenhoff, Earl F.; and Ostrander, William J., to Chevron Research Company. Method for the interpretation of envelope-related seismic records to yield valuable characteristics, such as gas-bearing potential and lithology of strata. 4,573,148, Cl. 367-47.000.
Herman Miller, Inc.: *See*—
DeFouw, Jerry A.; and Kelley, James O., 4,571,907, Cl. 52-239.000.
Herr, Dean S.: *See*—
Groff, Gordon S.; and Herr, Dean S., 4,572,428, Cl. 236-44.00A.
Herrera Giammattei, Octavio; Veramontes Brown, Federico; Beltran Leyva, Benedo; and Cervantes Patino, Damian, to Vitro Tec Fideicomiso. Decorating system for ceramic flatware. 4,572,068, Cl. 101-35.000.
Herrmidifier Company, Inc.: *See*—
Groff, Gordon S.; and Herr, Dean S., 4,572,428, Cl. 236-44.00A.
Herst, Douglas J.; and Ngai, Peter Y. Y. Linear light passing media having certain striped characteristics. 4,573,111, Cl. 362-337.000.
Hertrich, Friedrich R., to Digital Equipment Corporation. Means for pulling tape from a reel. 4,572,460, Cl. 242-195.000.
Herve , Marcel. Variable electrical energy stabilizer. 4,573,004, Cl. 320-51.000.
Herziger, Gerd: *See*—
Bakowsky, Lothar; Beyer, Eckhard; Herziger, Gerd; and Locsen, Peter, 4,573,162, Cl. 372-61.000.
Hess, Douglas N., to Medtronic, Inc. Injection molded in-line connector assembly for bipolar leads. 4,572,605, Cl. 339-177.00R.
Hetmann, Richard; and Ziegler, Hermann, to Dr. Ing. h.c.F. Porsche A.G. Arrangement for lowering and lifting of a window of a motor vehicle door. 4,571,884, Cl. 49-72.000.
Heuberger, Erich; Knorrich, Wolf-Dieter; and Ehrhart, Karl-Josef, to Carl Edelmann Verpackungstechnik GmbH. Container with inner pouch and reclosable spout. 4,572,422, Cl. 229-7.00R.
Heuker of Hoek, Johannes G. J.; Clement, Cornelis J.; and van der Lee, Ernst M., to Captor Holding B.V. Safe guarded lockable container, particularly for transporting money and securities. 4,573,043, Cl. 340-571.000.
Hewitt, Harvey J.: *See*—
Foley, Geoffrey M. T.; and Hewitt, Harvey J., 4,572,883, Cl. 430-58.000.
Hewlett-Packard Company: *See*—
Curtis, G. Stephen; and Whipple, David P., 4,573,026, Cl. 332-18.000.
Haven, Kenneth R., 4,572,592, Cl. 312-7.200.
Stephens, Thomas P., 4,572,204, Cl. 128-675.000.
Tribolet, David C.; and Paulsen, David L., 4,573,129, Cl. 364-520.000.
Heyl, Gerrit, to Bayerische Motoren Werke Aktiengesellschaft. Front wheel suspension for motorcycles. 4,572,534, Cl. 280-276.000.
Heywood, Joseph R., deceased (by Heywood, Phyllis A., executrix), to 501 Ainsworth Nominees Pty. Limited. Handle release mechanism for poker machines. 4,572,010, Cl. 74-2.000.
Heywood, Phyllis A., executrix: *See*—
Heywood, Joseph R., deceased, 4,572,010, Cl. 74-2.000.
Hickey, John S., to General Electric Company. Inductively compensated trigger circuit for a chemically augmented fuse. 4,573,032, Cl. 337-162.000.
Hiedelberger Druckmaschinen AG: *See*—
Schwarzbeck, Erich, 4,572,069, Cl. 101-76.000.
Hiestand, Karl, to SMW Schneider & Weisshaupt GmbH. Power chuck. 4,572,524, Cl. 279-1.00C.
Higgen, Reinhard, to Amazonen Werke H. Dreyer GmbH & Co KG. Vibrating harrow. 4,572,300, Cl. 172-54.500.
Hilgert, Karl-Heinz: *See*—
Kretzschmann, Gunther; Scholz, Dieter; and Hilgert, Karl-Heinz, 4,572,740, Cl. 106-122.000.
Hill, Douglas J.: *See*—
Rockwood, Robert E.; Antkowiak, Richard P.; and Hill, Douglas J., 4,572,517, Cl. 277-53.000.
Himeno, Yasunori: *See*—
Nariai, Shigeru; Himeno, Yasunori; and Shimokawa, Naoki, 4,571,950, Cl. 62-89.000.
Hine, Edwin W.; and Rosenbloom, Jack B., to Proctor & Schwartz, Inc. Remoistening of tobacco. 4,572,218, Cl. 131-302.000.
Hines, Gordon E.; Henke, Arthur W.; and Burzan, Vernon J., to Hines Industries, Inc. Driveshaft rebuilding machine. 4,571,807, Cl. 29-252.000.
Hines Industries, Inc.: *See*—
Hines, Gordon E.; Henke, Arthur W.; and Burzan, Vernon J., 4,571,807, Cl. 29-252.000.
Hino, Masao; Honda, Mitsuyasu; and Seto, Toru, to Mitsubishi Jukogyo Kabushiki Kaisha. Method for reactivating catalysts used for removing nitrogen oxides with steam. 4,572,903, Cl. 502-55.000.
Hinson, Eulit M. Attache-podium. 4,571,774, Cl. 16-237.000.
Hinz, Bernhard; and Gruninger, Gerhard, to Deutsche Forschungs- und Versuchsanstalt fur Luft- und Raumfahrt e.V. Piston cylinder system, especially for internal combustion engines. 4,572,058, Cl. 92-187.000.
Hipson, Peter D.: *See*—
Westheimer, Thomas O.; and Hipson, Peter D., 4,573,119, Cl. 364-200.000.
Hiramitsu, Tetsushi: *See*—
Ono, Satoshi; Sugita, Hiroshi; and Hiramitsu, Tetsushi, 4,572,313, Cl. 180-78.000.
Hirata, Kazumi, to NSK-Warner K.K. Emergency lock retractor. 4,572,457, Cl. 242-107.40A.
Hirata, Noritsugu: *See*—
Maeda, Masaya; Hirata, Noritsugu; and Takimoto, Hiroyuki, 4,573,089, Cl. 360-77.000.

Hirata, Yasushi: *See*—
Ogawa, Masaki; Hirata, Yasushi; and Tsuchikura, Akira, 4,572,263, Cl. 152-537.000.
Hirata, Yoshikatsu, to Brother Kogyo Kabushiki Kaisha. Print paper feeding apparatus. 4,572,418, Cl. 226-74.000.
Hirayama, Yasunori: *See*—
Uemura, Noboru; Sahara, Hiroaki; and Hirayama, Yasunori, 4,571,885, Cl. 49-177.000.
Hirota, Koichi: *See*—
Kaieda, Osamu; Hirota, Koichi; Okitaka, Isao; and Nakamura, Toshiaki, 4,572,805, Cl. 260-465.00D.
Hirschmanner, Franz, to Voest-Alpine Aktiengesellschaft. Coiler for strip metal. 4,572,453, Cl. 242-72.00R.
Hitachi Automotive Eng. Co., Ltd.: *See*—
Nouthuka, Hirofumi; and Ohfuji, Mitsuo, 4,572,134, Cl. 123-438.000.
Hitachi Construction Machinery Co, Ltd.: *See*—
Aoyagi, Yukio; Izumi, Eiki; Tanaka, Sotaro; and Yamaguchi, Takeshi, 4,571,941, Cl. 60-466.000.
Hitachi Koki Co., Ltd.: *See*—
Matsumoto, Yoshikane; Kobayashi, Tsuneki; Kurosawa, Makoto; and Seino, Minoru, 4,572,685, Cl. 400-320.000.
Hitachi, Ltd.: *See*—
Hosaka, Nobuyoshi; and Shimizu, Tasuku, 4,572,868, Cl. 428-328.000.
Kanehori, Keiichi; Miyauchi, Katsuki; and Kudo, Tetsuichi, 4,572,873, Cl. 428-432.000.
Komatsu, Isamu; Anzai, Masayasu; and Hoshi, Nobuyoshi, 4,572,651, Cl. 355-4.000.
Kondo, Shinichi; Nakaya, Chitose; and Ishikawa, Shizuo, 4,572,201, Cl. 128-660.000.
Miura, Kiyoshi, 4,572,880, Cl. 430-25.000.
Nakata, Yukio; and Shiotsu, Osamu, 4,573,154, Cl. 371-34.000.
Nouthuka, Hirofumi; and Ohfuji, Mitsuo, 4,572,134, Cl. 123-438.000.
Saito, Hiroshi; Okayasu, Hiromasa; Tsuyuki, Shinichi; Kawana, Takeshi; Mifune, Takao; and Yoshizaki, Masanori, 4,571,822, Cl. 29-736.000.
Ueno, Keii; Ueda, Masanobu; Tanikawa, Minoru; and Suzuki, Masami, 4,571,977, Cl. 72-342.000.
Hitachi Metals, Ltd.: *See*—
Hattori, Takashi; and Otsuka, Tadao, 4,572,537, Cl. 280-433.000.
Katayama, Yoshio, 4,572,231, Cl. 137-246.150.
Hoath, Grantley R.: *See*—
Dyett, Derek H.; Hoath, Grantley R.; and Horsley, John K., 4,572,352, Cl. 198-457.000.
Hoechst Aktiengesellschaft: *See*—
Dallmann, Hermann; and Palmer, Hans J., 4,572,854, Cl. 428-35.000.
Geissler, Ulrich, 4,572,887, Cl. 430-288.000.
Witte, Horst, 4,572,028, Cl. 74-828.000.
Hoechst CeramTec Aktiengesellschaft: *See*—
Pollak, Werner; Blecha, Michael; and Specht, Gerhard, 4,572,848, Cl. 427-294.000.
Hoeksema, Ari H., to Otto Fastening Systems Ltd. Structure member connector. 4,572,694, Cl. 403-187.000.
Hoerbiger Pneumatic Gesellschaft mbH: *See*—
Wewerka, Peter, 4,572,057, Cl. 92-165.0PR.
Hoesch Werke AG: *See*—
Komp, Uwe; Henke, Klaus; and Wozniak, Johannes, 4,572,587, Cl. 305-56.000.
Hofer, Heinz: *See*—
Arnold, Herbert; Hofer, Heinz; and Horbelt, Michael, 4,572,126, Cl. 123-325.000.
Hoffman, Ernest G.: *See*—
Ganssle, Robert; Hoffman, Ernest G.; and Neuroth, David H., 4,572,926, Cl. 174-103.000.
Hoffman, Jeffrey G.: *See*—
Stevens, Stanley J.; and Hoffman, Jeffrey G., 4,572,718, Cl. 411-107.000.
Hofmann, Manfred: *See*—
Hartel, Volker; and Hofmann, Manfred, 4,572,002, Cl. 73-809.000.
Hog, Peter: *See*—
Dreschel, Jurgen; Mobs, Heinrich; and Hog, Peter, 4,572,497, Cl. 270-58.000.
Hogfeldt, Birgitta, administrator: *See*—
Hogfeldt, Carl-Erik, deceased, 4,572,943, Cl. 219-273.000.
Hogfeldt, Carl-Erik, deceased (by Hogfeldt, Birgitta, administrator), to Acela Pump AB. Electrical steam generator for intermittent operation. 4,572,943, Cl. 219-273.000.
Hokkai Can Co., Ltd.: *See*—
Kobayashi, Koji; and Shimizu, Keisuke, 4,572,393, Cl. 220-270.000.
Holden, Jerry B.: *See*—
Heideman, Robert J.; Holden, Jerry B.; and Crain, Richard W., 4,571,870, Cl. 42-1.00A.
Holland, Anthony: *See*—
Castellani, Norman; and Holland, Anthony, 4,572,923, Cl. 174-48.000.
Holmberg, Arthur, Jr.; and Altman, Earl M., to United States of America, Air Force. Low temperature rate controller. 4,572,488, Cl. 267-8.00R.
Homer, John C.: *See*—
Stock, Arthur J.; Christofer, Donald E.; Homer, John C.; Torok, Robert J.; and Whittington, Thomas, 4,572,710, Cl. 414-146.000.
Honda Giken Kogyo K.K.: *See*—
Hasegawa, Shumpei; Mishima, Yoshibumi; Kishi, Noriyuki; and Makino, Yuzi, 4,572,141, Cl. 123-339.000.
Isono, Tokio; and Tachikawa, Shoji, 4,572,317, Cl. 180-227.000.
Nakamura, Shuji; Koike, Masami; and Yasuki, Shigehiro, 4,572,572, Cl. 296-223.000.
Otobe, Yutaka, 4,572,129, Cl. 123-440.000.
Umesaki, Shigeo; and Hasegawa, Shumpei, 4,572,143, Cl. 123-479.000.
Honda Giken Kogyo Kabushiki Kaisha: *See*—
Hasegawa, Shumpei; Shiraiwa, Michitaka; and Tsuchiya, Sadatomo, 4,572,149, Cl. 123-589.000.
Morita, Isamu, 4,572,321, Cl. 180-297.000.
Nakashima, Waichiro; Sasaki, Hiroshi; and Nishizaki, Katsuhiro, 4,572,271, Cl. 164-97.000.
Sakurai, Yoshimi; and Miyake, Junichi, 4,572,030, Cl. 74-866.000.
Honda, Kazuhiko: *See*—
Sakai, Tetsuro; and Honda, Kazuhiko, 4,573,086, Cl. 358-11.000.
Honda, Mitsuyasu: *See*—
Hino, Masao; Honda, Mitsuyasu; and Seto, Toru, 4,572,903, Cl. 502-55.000.
Honda, Yasuhisa: *See*—
Nakai, Masaaki; Ishimura, Toshihiko; and Honda, Yasuhisa, 4,572,638, Cl. 354-286.000.
Honeycutt, Thomas E.: *See*—
Roberts, Thomas G.; and Honeycutt, Thomas E., 4,571,954, Cl. 62-514.00R.
Honeywell Inc.: *See*—
Durand, William W.; and Knowles, Gary R., 4,572,958, Cl. 250-495.100.
Westley, Curtis E., 4,572,333, Cl. 185-40.00R.
Honeywell Information Systems Inc.: *See*—
Ong, Richard H.; Economopoulos, Peter C.; and Guenthner, Russell W., 4,573,116, Cl. 364-200.000.
Honig, Emanuel M., to United States of America, Energy. Counterpulse railgun energy recovery circuit. 4,572,964, Cl. 307-106.000.
Honig, Gunter, to Robert Bosch GmbH. Method and apparatus for measuring the rate of air flow in the intake tube of an internal combustion engine. 4,571,990, Cl. 73-118.000.
Hopkins, Jeffrey E.: *See*—
Durham, Claudia; and Hopkins, Jeffrey E., 4,572,501, Cl. 272-73.000.
Hopwood, Francis W.: *See*—
Buchalter, Michael S.; Hopwood, Francis W.; and Haynes, James T., 4,573,027, Cl. 333-17.00R.
Hor, Leopold: *See*—
Voigt, Ulrich; Hor, Leopold; and Stoebrich, Werner, 4,572,597, Cl. 312-257.0SK.
Horbelt, Michael: *See*—
Arnold, Herbert; Hofer, Heinz; and Horbelt, Michael, 4,572,126, Cl. 123-325.000.
Arnold, Herbert; Horbelt, Michael; and Dahlke, Gerald, 4,572,142, Cl. 123-478.000.
Horikawa, Kenichi; Yamamoto, Yoshinori; and Kawakami, Kenji, to Sony Corporation. Magnetic tape cassette. 4,572,461, Cl. 242-198.000.
Horiuchi, Yusuke; and Ootani, Hisao, to Toyota Jidosha Kabushiki Kaisha. Clutch disk. 4,572,344, Cl. 192-106.100.
Horner, John A. Leak detector. 4,571,987, Cl. 73-49.200.
Horsley, John K.: *See*—
Dyett, Derek H.; Hoath, Grantley R.; and Horsley, John K., 4,572,352, Cl. 198-457.000.
Horton, Robert L., to Phillips Petroleum Company. In-situ recovery of mineral values. 4,572,581, Cl. 299-4.000.
Horvath, Pal: *See*—
Sooki-Toth, Gabor; Horvath, Pal; Jedlovszky, Palne ; Keszler, Jozsef; and Sors, Laszlo , 4,572,793, Cl. 252-182.100.
Hosaka, Nobuyoshi; and Shimizu, Tasuku, to Hitachi, Ltd. Anti-corrosive sealing tape. 4,572,868, Cl. 428-328.000.
Hoshi, Nobuyoshi: *See*—
Komatsu, Isamu; Anzai, Masayasu; and Hoshi, Nobuyoshi, 4,572,651, Cl. 355-4.000.
Hosiden Electronics Co., Ltd.: *See*—
Kakuta, Toshio; and Kikuchi, Toshio, 4,572,930, Cl. 200-5.00R.
Hotta, Yuji: *See*—
Nakamura, Masaki; Abe, Takao; Koshizuka, Kunihiro; Kitamura, Shigehiro; Ishii, Fumio; and Hotta, Yuji, 4,572,860, Cl. 428-216.000.
Houk, Stanley M. Black powder measuring device the pro-charger. 4,571,873, Cl. 42-90.000.
House, Thomas R., to Parks-Cramer Company. Single-air traveling suction blower cleaner with automatic doffing. 4,572,745, Cl. 134-10.000.
Houser, Kirk D.: *See*—
Oates, Robert M.; Cooper, Herbert C.; and Houser, Kirk D., 4,573,215, Cl. 455-607.000.
Hovance, Hubert T.: *See*—
Still, Donald O.; and Hovance, Hubert T., 4,572,046, Cl. 83-171.000.
Howard, Frank A., to Mostyn Chemicals Ltd. Agricultural application of boron compounds. 4,572,733, Cl. 71-64.080.
Hoya Lens Corporation: *See*—
Saigo, Tsuyoshi; and Kitani, Akira, 4,573,121, Cl. 364-413.000.
Hoyen, Harry A., to Eastman Kodak Company. Direct positive photographic elements with incorporated maximum density enhancing antifoggants. 4,572,892, Cl. 430-410.000.

Hsiung, Du Y.; Davis, Chester A.; and Nicholson, Harold J., to Helene Curtis Industries, Inc. Composition for altering the configuration of hair. 4,572,220, Cl. 132-7.000.

Huang, Min-Siu: *See*—
Damouny, Nabil G.; and Huang, Min-Siu, 4,573,118, Cl. 364-200.000.

Hubbard, James R.; and Berry, Ronald B., to Graphic Controls Corporation. Instrument marker pen and pen arm assembly. 4,573,060, Cl. 346-140.00A.

Hubbert, David W.; and Robinson, Bobby L., to Athlone Industries, Inc. Game ball. 4,572,507, Cl. 273-60.00R.

Huber, Willi; and Schmidhauser, Markus, to J. Wagner AG. Electrostatic spraying apparatus. 4,572,437, Cl. 239-703.000.

Hubert, Herve ; and Musikas, Claude, to Commissariat a l'Energie Atomique. Process for recovering actinides and/or lanthanides. 4,572,802, Cl. 534-12.000.

Hubert, Jean, to A L M. Unit having degrees of freedom, such as a surgical operating table. 4,572,493, Cl. 269-325.000.

Hudson, Lloyd: *See*—
Nielson, Kimberly H.; and Hudson, Lloyd, 4,572,008, Cl. 73-864.510.

Huel, Georges. Signboards. 4,571,869, Cl. 40-605.000.

Huels Aktiengesellschaft: *See*—
Muller, Dieter J.; and Spielbrink, Heinrich, 4,572,743, Cl. 134-3.000.

Huffman, Albertus W.: *See*—
Huffman, Albertus W., Jr.; and Truhan, Andrew, 4,572,429, Cl. 237-2.00B.

Huffman, Albertus W., Jr.; and Truhan, Andrew, to Huffman, Albertus W. Method and means for conserving energy requirements and improving working conditions of a sock finishing factory. 4,572,429, Cl. 237-2.00B.

Huft, John M., to GTE Communication Systems Corporation. Current limiter for telephone office signalling. 4,572,927, Cl. 179-16.0AA.

Hug, Paul; Umeda, William; Chapdelaine, Paul; and Paul, Raymond E., to Storage Technology Partners. Apparatus for feeding wire to a wire bonding mechanism. 4,572,421, Cl. 228-103.000.

Hughes Tool Company: *See*—
Renfro, James G., 4,572,036, Cl. 81-57.200.

Hukuhara, Seiichi, to Sanden Corporation. Scroll manufacturing tool. 4,572,276, Cl. 164-342.000.

Hunt, James R.; and Balent, Russell P., to Fluorocarbon Company, The. Centrifugal wafer processor. 4,571,850, Cl. 34-242.000.

Hunter, Burnis L., to Sewell Plastics, Inc. Coupling assembly. 4,572,355, Cl. 198-803.120.

Hunter, R. Scott: *See*—
Muise, Herbert D.; and Hunter, R. Scott, 4,572,424, Cl. 229-39.00R.

Huntington National Bank, The: *See*—
Williams, Marvin E., 4,571,867, Cl. 40-405.000.

Hursh, David F.; and de Irureta-Goyena, Anthony, to Foster-Boyd, Inc. Two-ply athletic sock with low-friction interface surfaces. 4,571,960, Cl. 66-196.000.

Hutchins, Bruce E., to General Motors Corporation. Motor vehicle loudspeaker installation. 4,572,326, Cl. 181-150.000.

Hyams, Seymour, to Wiener Laces, Inc. Method of forming seamless fabric cups and resulting products. 4,572,195, Cl. 128-463.000.

Hydra Systems International, Inc.: *See*—
Heideman, Robert J.; Holden, Jerry B.; and Crain, Richard W., 4,571,870, Cl. 42-1.00A.

Hydril Company: *See*—
Weston, Harry, 4,572,298, Cl. 166-379.000.

Hydromatik GmbH: *See*—
Wuchenauer, Johann, 4,571,940, Cl. 60-444.000.

Hydrostress AG: *See*—
Bieri, Hans, 4,572,580, Cl. 299-1.000.

I Ling Industry Co., Ltd.: *See*—
Leu, Don J., 4,572,483, Cl. 266-48.000.

I.P.E. Nuova Bialetti S.p.A. Industria Prodotti Elettrodomastici: *See*—
Cristante, Guido, 4,572,445, Cl. 241-37.500.

Ibaraki Seiki Co., Ltd.: *See*—
Suga, Tadoru, 4,571,927, Cl. 53-547.000.

Ichimiya, Yoshichika; Sudo, Tsuneta; Takehisa, Turo; and Shimada, Katsumi, to Takeda Riken Co., Ltd. I/O Control system for data transmission and reception between central processor and I/O units. 4,573,120, Cl. 364-200.000.

Ichiyanagi, Toshikazu: *See*—
Yamamoto, Hiroshi; and Ichiyanagi, Toshikazu, 4,572,642, Cl. 354-402.000.

IDR Enterprises, Inc.: *See*—
Krizik, Jan G., 4,572,607, Cl. 356-32.000.

Iida, Kazuhiko, to Tokyo Shibaura Denki Kabushiki Kaisha. Document information filing system. 4,573,084, Cl. 358-300.000.

Iida, Toyoshi: *See*—
Uemura, Michio; Sato, Yutaka; Nakamura, Masaru; and Iida, Toyoshi, 4,572,789, Cl. 252-8.50A.

Iiyama, Hiroshi: *See*—
Komasaku, Seiichi; Iiyama, Hiroshi; Watanabe, Noboru; and Tanaka, Osamu, 4,571,844, Cl. 33-366.000.

Ikari Machine Tools Co., Ltd.: *See*—
Dosaka, Akira, 4,571,890, Cl. 51-92.0ND.

Ikeda, Noriaki; Kai, Mutsunori; and Asai, Hiraki, to Ishikawajima-Harima Jukogyo Kabushiki Kaisha. Method and device for winding paper. 4,572,451, Cl. 242-56.00R.

Ikeda, Shinji, to Toyota Jidosha Kabushiki Kaisha. Ignition timing sensor for diesel engine. 4,572,119, Cl. 123-145.00A.

Ikegami, Takeshi: *See*—
Tada, Mitsuro; Ikegami, Takeshi; and Komori, Hisao, 4,572,652, Cl. 355-14.00R.

Ikei, Nobuhiro: *See*—
Shimizu, Fumio; Tachikawa, Tetsuya; Ikei, Nobuhiro; Noda, Atunari; Hashimura, Etsuro; and Imagawa, Kenichi, 4,572,800, Cl. 260-112.50R.

Ikemoto, Yutaka, to Sharp Kabushiki Kaisha. Talking clock calculator. 4,573,134, Cl. 364-705.000.

Ikemura, Akio; and Kajiki, Minoru, to Yoshida Kogyo K.K. Ventilation system for building. 4,572,282, Cl. 165-54.000.

Ikenoue, Shinobu: *See*—
Shiraishi, Tomio; and Ikenoue, Shinobu, 4,572,931, Cl. 200-11.0DA.

Ikenoue, Yoshikazu: *See*—
Ito, Masazumi; Irie, Yutaka; Ikenoue, Yoshikazu; and Nakamura, Minoru, 4,572,653, Cl. 355-14.00R.

Ikeoka, Nao-aki: *See*—
Baba, Kiyokazu; and Ikeoka, Nao-aki, 4,571,979, Cl. 72-350.000.

Ikeya, Hirotoshi; Suzuki, Shuichi; Oguni, Takayuki; Matsumoto, Kazutaka; and Hatanaka, Akiko, to Tokyo Shibaura Denki Kabushiki Kaisha. Resin encapsulation type semiconductor device. 4,572,853, Cl. 428-76.000.

Ikezawa, Yukio; and Yoshino, Hisakazu, to Tokyo Kogaku Kikai Kabushiki Kaisha. Lens judging apparatus of lens meter. 4,571,842, Cl. 33-200.000.

Illinois Carbon Products: *See*—
Driscoll, John S.; and Palka, Robert E., 4,572,452, Cl. 242-56.200.

Illinois Tool Works Inc.: *See*—
Swick, Edwin G.; and Forsberg, Jerold M., 4,572,717, Cl. 411-11.000.

Imagawa, Kenichi: *See*—
Shimizu, Fumio; Tachikawa, Tetsuya; Ikei, Nobuhiro; Noda, Atunari; Hashimura, Etsuro; and Imagawa, Kenichi, 4,572,800, Cl. 260-112.50R.

Imagawa, Kyoshiro: *See*—
Sakuragi, Shiro; Saitoh, Mitsunori; Kotani, Haruo; and Imagawa, Kyoshiro, 4,572,609, Cl. 350-96.300.

Imahori, Kazutomo; Nakajima, Hiroshi; Iwasaki, Tatsuo; Tomioka, Isao; and Yamamoto, Keiichi, to Imahori, Kazutomo; Rikagaku Kenkyusho; and Unitika Ltd. Process for synthesizing peptides or peptide derivatives. 4,572,894, Cl. 435-68.000.

Imai, Masaharu, to Olympus Optical Co., Ltd. Solid state image sensing device with photometry function. 4,573,077, Cl. 358-212.000.

Imai, Masanori; and Kanzaki, Hisao, to Fuji Photo Film Co., Ltd. Lithographic printing plate and process for production thereof. 4,572,889, Cl. 430-302.000.

Imamura, Shuichiro: *See*—
Kojima, Shuichi; Nakao, Masashi; Gotoh, Miyuki; Ishido, Takao; and Imamura, Shuichiro, 4,572,244, Cl. 139-103.000.

Imatron, Inc.: *See*—
Rutt, Brian K., 4,573,179, Cl. 378-10.000.

Imhof, Ernst: *See*—
Grunwald, Werner; Imhof, Ernst; Komaroff, Iwan; Mayer, Rolf; and Schmid, Gunther, 4,572,146, Cl. 123-549.000.

Imperial Chemical Industries PLC: *See*—
Orchard, Stanley E.; and Taylor, Celia C., 4,572,672, Cl. 356-446.000.

Ina, Toshikazu: *See*—
Nakano, Osamu; Ina, Toshikazu; and Kawai, Hisasi, 4,572,963, Cl. 307-10.00R.

Inada, Masami; Kawabata, Yasuhiro; and Akagi, Motonobu, to Aisin Seiki Kabushiki Kaisha. Turbocharger control device with optical turbocharger shaft speed sensing. 4,571,945, Cl. 60-602.000.

Inbar, Dan; and Ganin, Alexander, to Elscint, Ltd. Method of and means for compensating for the dead time of a gamma camera. 4,573,122, Cl. 364-414.000.

Incom, Inc.: *See*—
Jeskey, Richard V., 4,573,082, Cl. 358-250.000.

Indag Gesellschaft fur Industriebedarf mbH: *See*—
Wild, Rudolf, 4,572,758, Cl. 156-256.000.

Indianapolis Center for Advanced Research: *See*—
Schroeder, Eugene; and Fry, Francis J., 4,572,200, Cl. 128-660.000.

Industrial Design Associates, (IDA): *See*—
Handler, Howard; and Wilson, Ronald L., 4,572,988, Cl. 315-209.00R.

Industrial Solar Technology: *See*—
Gee, Randall C., 4,571,812, Cl. 29-445.000.

Industrie Pininfarina S.p.A.: *See*—
Trucco, Dario, 4,572,570, Cl. 296-107.000.

Ingaglio, Michael L., to AT&T Bell Laboratories. Removal tool for terminal with compliant pins. 4,571,824, Cl. 29-764.000.

Inkel, Marcel, to Placo Molders Inc. Apparatus for transferring material from a feed spool to a take-up spool. 4,572,462, Cl. 242-199.000.

Inland Steel Company: *See*—
Slagley, William E., 4,572,487, Cl. 266-270.000.

Inoue, Akira, to Olympus Optical, Co., Ltd. Film end detector for use in cameras. 4,572,637, Cl. 354-173.110.

Inoue, Hiroshi; Tsuge, Akihiko; and Komeya, Katsutoshi, to Kabushiki Kaisha Toshiba. Method for preparing coated powder. 4,572,844, Cl. 427-180.000.

Inoue, Takehisa: *See*—
Iwayama, Kazuyoshi; Inoue, Takehisa; Sato, Kimio; Hayakawa, Norio; and Fujii, Masaki, 4,572,779, Cl. 208-111.000.

Instituto Venezolano de Investigaciones Cientificas (I.V.I.C.): *See*—
Chang, Victor, 4,572,121, Cl. 123-203.000.

Instromedix, Inc.: *See*—
Royse, Suzanne M., 4,572,182, Cl. 128-325.000.
Instrument Specialties Co., Inc.: *See*—
May, James P.; and Eppler, Arthur R., 4,572,921, Cl. 174-35.0GC.
Instrumentverken Aktiebolag: *See*—
Lindskog, Clas G., 4,571,843, Cl. 33-355.00R.
Intel Corporation: *See*—
Galin, Robert, 4,573,045, Cl. 340-825.500.
International Business Machines Corporation: *See*—
Bednar, Gregory M.; Fitzpatrick, Brian E.; Harmon, John C.; and Narasimha, Manthri S. I., 4,573,200, Cl. 382-47.000.
Chen, Shu-Chun; and Tseng, Samuel C., 4,573,199, Cl. 382-47.000.
Croley, Donald F.; and Dyer, Stanley, 4,572,687, Cl. 400-696.000.
Gaudet, James L.; Lineman, Harry L.; Chukran, Rudolph E.; Neuman, Grover H.; and Barnes, Johnny G., 4,573,138, Cl. 364-900.000.
International Energy Conservation Systems: *See*—
Leale, Luis; Saunders, Edward A.; and Keil, Enrique, 4,572,990, Cl. 315-220.000.
International Flavors & Fragrances Inc.: *See*—
van Loveren, Augustinus G.; Sprecker, Mark A.; Whelan, Patrick; and Hanna, Marie R., 4,572,796, Cl. 252-522.00R.
International Standard Electric Corporation: *See*—
Hentschke, Siegbert; and Schaper, Klaus, 4,573,167, Cl. 375-27.000.
Intevep S.A.: *See*—
Krasuk, Julio; Solari, Rodolfo B.; Aquino, Luis G.; Rodriguez, Jose V.; and Granados, Alejandro, 4,572,781, Cl. 208-309.000.
Inverardi, Giuseppe: *See*—
Chiari, Natale; and Inverardi, Giuseppe, 4,571,930, Cl. 57-274.000.
Ioshpa, Vladimir G.; Kirievsky, Boris A.; Kravchenko, Anatoly P.; Kudinov, Gennady A.; Kutsykovich, Dorina B.; Lysenko, Evgeny E.; Shokul, Anatoly A.; Nekrasov, Ignaty N.; Filipiev, Oleg V.; and Lugansky, Vladimir P., to Vsesojuzny Nauchno-Issledova-Telsky I Proektny Institut Po Ochistke Tekhnolo. Method of manufacturing cooling plates for use in metallurgical furnaces and a cooling plate. 4,572,269, Cl. 164-93.000.
IPOS Gesellschaft fur integrierte Prothese-Entwicklung und orthopadietechnischen Service mbH & Co. KG: *See*—
Prahl, Jan, 4,572,196, Cl. 128-581.000.
Irie, Yutaka: *See*—
Ito, Masazumi; Irie, Yutaka; Ikenoue, Yoshikazu; and Nakamura, Minoru, 4,572,653, Cl. 355-14.00R.
Irvin Industries Inc.: *See*—
Jensen, Kirk S., 4,571,888, Cl. 49-450.000.
Irving, Edward: *See*—
Goodin, Jonathan W.; and Irving, Edward, 4,572,890, Cl. 430-325.000.
Ishido, Takao: *See*—
Kojima, Shuichi; Nakao, Masashi; Gotoh, Miyuki; Ishido, Takao; and Imamura, Shuichiro, 4,572,244, Cl. 139-103.000.
Ishidoshiro, Hiroshi: *See*—
Sando, Yoshikazu; and Ishidoshiro, Hiroshi, 4,571,962, Cl. 68-5.00E.
Ishigami, Kazuhiro, to Nissan Motor Company, Limited. Fuel supply control system for an internal combustion engine. 4,572,139, Cl. 123-478.000.
Ishihara, Kazuo; and Kobayashi, Haruo, to Minolta Camera Kabushiki Kaisha. Latch device for cartridge compartment door of a camera. 4,572,641, Cl. 354-121.000.
Ishii, Fumio: *See*—
Nakamura, Masaki; Abe, Takao; Koshizuka, Kunihiro; Kitamura, Shigehiro; Ishii, Fumio; and Hotta, Yuji, 4,572,860, Cl. 428-216.000.
Ishikawa, Shizuo: *See*—
Kondo, Shinichi; Nakaya, Chitose; and Ishikawa, Shizuo, 4,572,201, Cl. 128-660.000.
Ishikawajima-Harima Jukogyo Kabushiki Kaisha: *See*—
Ikeda, Noriaki; Kai, Mutsunori; and Asai, Hiraki, 4,572,451, Cl. 242-56.00R.
Matsumoto, Takayuki; and Iwai, Tadahiko, 4,571,820, Cl. 29-723.000.
Ishimura, Toshihiko: *See*—
Nakai, Masaaki; Ishimura, Toshihiko; and Honda, Yasuhisa, 4,572,638, Cl. 354-286.000.
Isono, Tokio; and Tachikawa, Shoji, to Honda Giken Kogyo K.K. Position control system for the body of a vehicle. 4,572,317, Cl. 180-227.000.
Ito, Hisayoshi: *See*—
Takamizawa, Daisuke; Okada, Aguri; and Ito, Hisayoshi, 4,572,593, Cl. 312-114.000.
Ito, Kiichiro: *See*—
Yamaguchi, Noboru; and Ito, Kiichiro, 4,572,466, Cl. 248-73.000.
Ito, Masahiko: *See*—
Kanzaka, Yoshihiro; and Ito, Masahiko, 4,571,781, Cl. 24-95.000.
Ito, Masazumi; Irie, Yutaka; Ikenoue, Yoshikazu; and Nakamura, Minoru, to Minolta Camera Kabushiki Kaisha. Image density control apparatus for copying machines. 4,572,653, Cl. 355-14.00R.
Ito, Takaaki: *See*—
Tanahashi, Toshio; Ito, Takaaki; and Uranishi, Koji, 4,572,394, Cl. 220-86.00R.
Itoh, Chikara: *See*—
Tojo, Toru; Mori, Ichiro; Shinozaki, Toshiaki; Sugihara, Kazuyoshi; Tabata, Mitsuo; and Itoh, Chikara, 4,572,956, Cl. 250-492.200.
Itozawa, Kenji: *See*—
Nakamura, Issei; and Itozawa, Kenji, 4,572,866, Cl. 428-328.000.
Nakamura, Issei; and Itozawa, Kenji, 4,572,867, Cl. 428-328.000.
ITT Corporation: *See*—
Nieman, Gerald R., 4,572,600, Cl. 339-14.00R.
ITT Industries, Inc.: *See*—
Haar, Gerhard; Jakob, Heinz; Prohaska, Hans; Schneider, Theodor; Schubert, Karl-Friedrich; and Wohrle, Werner, 4,572,979, Cl. 310-68.00R.
Rossiter, Timothy J. M., 4,573,136, Cl. 364-728.000.
Schiel, Lothar, 4,572,055, Cl. 91-369.00A.
Ivy J. Foret Associates, Inc.: *See*—
Bourgeois, Leverence, Jr., 4,572,301, Cl. 172-445.100.
Iwai, Tadahiko: *See*—
Matsumoto, Takayuki; and Iwai, Tadahiko, 4,571,820, Cl. 29-723.000.
Iwami, Isamu: *See*—
Yamazoe, Katsuhiko; Yoshino, Akira; Kitahama, Yoshiharu; and Iwami, Isamu, 4,572,803, Cl. 534-16.000.
Iwasaki, Masayuki: *See*—
Maeda, Minoru; Iwasaki, Masayuki; and Shinozaki, Fumiaki, 4,572,888, Cl. 430-288.000.
Iwasaki, Nobuhiro: *See*—
Suga, Masataka; Yamada, Makoto; Takahashi, Kazuhide; Iwasaki, Nobuhiro; Matsui, Kazuyuki; Izawa, Toru; Watanabe, Itaru; and Tagawa, Hisatoshi, 4,572,748, Cl. 148-12.00F.
Iwasaki, Tatsuo: *See*—
Imahori, Kazutomo; Nakajima, Hiroshi; Iwasaki, Tatsuo; Tomioka, Isao; and Yamamoto, Keiichi, 4,572,894, Cl. 435-68.000.
Iwata, Nobuo, to Ricoh Company, Ltd. Lubricated universal joint. 4,572,682, Cl. 400-144.200.
Iwata, Yasuji: *See*—
Sasaki, Noboru; Mukai, Teruo; and Iwata, Yasuji, 4,571,759, Cl. 5-90.000.
Iwayama, Kazuyoshi; Inoue, Takehisa; Sato, Kimio; Hayakawa, Norio; and Fujii, Masaki, to Toray Industries, Inc.; and Fuji Oil Co., Ltd. Process for the dewaxing of hydrocarbon fractions. 4,572,779, Cl. 208-111.000.
Izawa, Toru: *See*—
Suga, Masataka; Yamada, Makoto; Takahashi, Kazuhide; Iwasaki, Nobuhiro; Matsui, Kazuyuki; Izawa, Toru; Watanabe, Itaru; and Tagawa, Hisatoshi, 4,572,748, Cl. 148-12.00F.
Izumi, Eiki: *See*—
Aoyagi, Yukio; Izumi, Eiki; Tanaka, Sotaro; and Yamaguchi, Takeshi, 4,571,941, Cl. 60-466.000.
J. C. Kinley Co.: *See*—
Kinley, Karl S., 4,572,288, Cl. 166-63.000.
J. I. Case Company: *See*—
Frisbee, Claude M., 4,572,302, Cl. 172-813.000.
J. Wagner AG: *See*—
Huber, Willi; and Schmidhauser, Markus, 4,572,437, Cl. 239-703.000.
Jackman, Warren M.; and Lazzara, Ralph, to University of Oklahoma, Board of Regents for The. System for prevention of paroxysmal supraventricular tachycardia. 4,572,192, Cl. 128-419.0PG.
Jackson, Claude: *See*—
Breakey, Fred B.; Barber, Leo D.; Chapman, Richard L.; Godin, Norman; Henry, Robert; Jackson, Claude; Romberger, John; and Seidl, Rudolph, 4,572,381, Cl. 211-94.000.
Jacobs, Harold: *See*—
Dixon, Samuel, Jr.; and Jacobs, Harold, 4,573,213, Cl. 455-330.000.
Jacobs Manufacturing Company, The: *See*—
Sickler, Kenneth H., 4,572,114, Cl. 123-21.000.
Jacobs, Norman A., to AT&T Teletype Corporation. Method of manufacturing a thermal print head. 4,571,826, Cl. 29-840.000.
Jacobs, Paul H.; and Collette, Douglas P., to Aerotron, Inc. Compressed single side band communications system and method. 4,573,208, Cl. 455-71.000.
Jacobsen, Niels O.: *See*—
Hellegaard, Kjeld; Doktor, Hans; and Jacobsen, Niels O., 4,572,969, Cl. 307-254.000.
Jacobsen, Stephen C., to Jacobson Research Corporation. Key holder. 4,571,967, Cl. 70-456.00R.
Jacobson Research Corporation: *See*—
Jacobsen, Stephen C.; 4,571,967, Cl. 70-456.00R.
Jade Corporation, The: *See*—
Spadafora, Vincent A., 4,572,757, Cl. 156-252.000.
Jaguar Cars Limited: *See*—
Cady, John B., 4,572,318, Cl. 180-248.000.
Jakob, Heinz: *See*—
Haar, Gerhard; Jakob, Heinz; Prohaska, Hans; Schneider, Theodor; Schubert, Karl-Friedrich; and Wohrle, Werner, 4,572,979, Cl. 310-68.00R.
James, Jasper T., III, to Sumter Casket Company. Casket with attachable corners. 4,571,790, Cl. 27-10.000.
James, Kenneth A.; Quick, William H.; and Strahan, Virgil H., to Rockwell International Corporation. Method and apparatus for a Fabry-Perot multiple beam fringe sensor. 4,572,669, Cl. 356-352.000.
James River-Dixie/Northern, Inc.: *See*—
Tao, Thomas, 4,572,440, Cl. 241-23.000.
Jan ter Bals, Berend, to Weimar N.V. Conveying apparatus. 4,572,354, Cl. 198-592.000.
Janick, Harry G. Safety clutch and quick release assembly for grain augers and the like. 4,572,356, Cl. 198-667.000.
Janome Sewing Machine Industry Co., Ltd.: *See*—
Hanyu, Susumu; Koide, Akio; and Kanemaki, Koji, 4,572,090, Cl. 112-153.000.

Makabe, Hachiro; and Kongoh, Takeshi, 4,572,095, Cl. 112-456.000.

Janssen, Owen R.; and Spector, George. Knot tying tool. 4,572,554, Cl. 289-17.000.

Japan Bano'k Co., Ltd.: *See—*
Furutsu, Akira, 4,571,787, Cl. 24-543.000.

Japan Metals and Chemicals Co., Ltd.: *See—*
Uemura, Michio; Sato, Yutaka; Nakamura, Masaru; and Iida, Toyoshi, 4,572,789, Cl. 252-8.50A.

Jaquette, Robert D., to Air-Way Manufacturing Company. Fluid connector. 4,572,551, Cl. 285-108.000.

Jasmin, Claude: *See—*
Azam, Guy; Convert, Guy; Dufour, Jacques; Jasmin, Claude; and Sidi, Joel, 4,572,190, Cl. 128-399.000.

Jeco Co., Ltd.: *See—*
Komasaku, Seiichi; Iiyama, Hiroshi; Watanabe, Noboru; and Tanaka, Osamu, 4,571,844, Cl. 33-366.000.

Jedlovszky, Palne : *See—*
Sooki-Toth, Gabor; Horvath, Pal; Jedlovszky, Palne ; Keszler, Jozsef; and Sors, Laszlo , 4,572,793, Cl. 252-182.100.

Jenq-Shyong, Ke. Monkey wrench. 4,572,037, Cl. 81-126.000.

Jensen, James W.; and Haake, Joseph R., to Adolph Coors Company. Control stretch laminating device. 4,572,752, Cl. 156-64.000.

Jensen, Jens R.: *See—*
Pedersen, Arne M.; and Jensen, Jens R., 4,572,833, Cl. 424-20.000.

Jensen, Kirk S., to Irvin Industries Inc. Vent window latch. 4,571,888, Cl. 49-450.000.

Jeschke, Willi, to Heidelberger Druckmaschinen AG. Device for exchanging printing medium between zones offset with respect to one another in longitudinal direction of a roller in a printing unit of a rotary printing machine. 4,572,072, Cl. 101-348.000.

Jeskey, Richard V., to Incom, Inc. Focusable display screen. 4,573,082, Cl. 358-250.000.

Jha, Mahesh C.: *See—*
Duyvesteyn, Willem P. C.; and Jha, Mahesh C., 4,572,771, Cl. 204-118.000.

Jim Walter Resources, Inc.: *See—*
Londrigan, Michael E., 4,572,919, Cl. 521-115.000.

Jinks, Jerry R.: *See—*
Rosenwinkel, Karen W.; and Jinks, Jerry R., 4,572,224, Cl. 132-88.500.

Johansen, Walter E., III: *See—*
Smith, Chadwick F.; and Johansen, Walter E., III, 4,572,189, Cl. 128-395.000.

Johansson, Arnold, to Aktiebolaget Bofors. Azimuth damper. 4,572,337, Cl. 188-268.000.

Johansson, Jan-Erik. Medicine cup. 4,572,373, Cl. 206-515.000.

John Fluke Mfg. Co., Inc.: *See—*
Cok, Steven P.; and Drucker, Eric R., 4,573,023, Cl. 331-1.00A.

Johns Hopkins University, The: *See—*
Fischell, Robert E., 4,571,749, Cl. 623-14.000.

Johns, Robert G.: *See—*
Bruno, Robert H.; Johns, Robert G.; Kipperman, Stuart; Mayer, Geoffrey R.; Protzmann, Donald E.; and Uhl, Robert F., 4,572,365, Cl. 206-306.000.

Johnson, David A. Device for attaching a front sling-receiving loop to a weapon. 4,571,872, Cl. 42-85.000.

Johnson, Joseph L., to United States of America, Army. Declipper/-feeder. 4,572,052, Cl. 86-48.000.

Johnson, Kenneth M.: *See—*
Leonard, Ronald J.; and Johnson, Kenneth M., 4,572,446, Cl. 242-7.020.

Johnson, Thomas E., to Timberjack Inc. Snubbing apparatus for grapples and the like. 4,572,567, Cl. 294-119.400.

Johnston, Stephen P., to S. J. Electro Systems, Inc. Mercury switch. 4,572,934, Cl. 200-222.000.

Joncour, Hubert: *See—*
Guillerot, Jean C.; Joncour, Hubert; Auvray, Gerard; and Balduzzi, Daniel, 4,573,052, Cl. 343-18.00E.

Jones, Jack E.; Fajner, Michael J.; and Zepnick, Ronald E., to Eaton Corporation. Push-push bayonet lamp socket. 4,572,601, Cl. 339-46.000.

Jones, Richard E., III: *See—*
Mauldin, Donald M.; and Jones, Richard E., III, 4,572,169, Cl. 128-80.00H.

Jonsson, Lars E., to AB Lofab-Square. Device for clamping tools. 4,572,526, Cl. 279-4.000.

Jordan, William T. Clothes drying garment bag. 4,572,364, Cl. 206-287.000.

Joseph, Brian J.; and Rumsey, Stephen C., to Eastman Kodak Company. Web tracking apparatus. 4,572,417, Cl. 226-20.000.

Josephson, Vernal; and Greenberg, Edmond L., to United States of America, Air Force. Radiation measuring system using transister flux sensors. 4,572,954, Cl. 250-370.000.

Josuttis, Horst; Meierkord, Ralf; and Welsch, Hans-Jurgen, to Harting Elektronik GmbH. Apparatus for filling cigarette papers with tobacco. 4,572,216, Cl. 131-70.000.

Jotwani, Haresh C., to Stromberg-Carlson Corp. Interface unit for telephone system having remote units. 4,573,151, Cl. 370-56.000.

Joyama, Norio: *See—*
Hachiya, Iwao; and Joyama, Norio, 4,572,835, Cl. 426-306.000.

Jujo Paper Co., Ltd.: *See—*
Satake, Toshimi; Minami, Toshiaki; Fujimura, Fumio; Oda, Satoshi; and Magami, Masato, 4,573,062, Cl. 346-209.000.

Jumberca, S.A.: *See—*
Dalmau Guell, Jose M., 4,571,958, Cl. 66-132.00R.

Juska, Donald D., to Senmed, Inc. Positive feed system for a surgical ligating instrument. 4,572,183, Cl. 128-325.000.

Juty, Andrzej J. J., to Metal Box p.l.c. Closures for containers. 4,572,398, Cl. 220-271.000.

Kabushiki Kaisha Daikin Seisakusho: *See—*
Koshimo, Masahiko, 4,572,339, Cl. 192-3.310.

Kabushiki Kaisha Hokushin Denki Seisakusho: *See—*
Azegami, Tadashi, 4,573,142, Cl. 365-45.000.

Kabushiki Kaisha Kobe Seiko Sho: *See—*
Fujii, Noritsugu; and Nishimura, Toshimitsu, 4,571,986, Cl. 73-49.100.

Kabushiki Kaisha Komatsu Seisakusho: *See—*
Baba, Kiyokazu; and Ikeoka, Nao-aki, 4,571,979, Cl. 72-350.000.
Hashimoto, Haruo; and Ono, Toyoichi, 4,572,131, Cl. 123-357.000.

Kabushiki Kaisha SG: *See—*
Toda, Jitsuo; and Shimizu, Wataru, 4,572,951, Cl. 250-231.0SE.

Kabushiki Kaisha Tokai Rika Denki Seisakusho: *See—*
Suzuki, Masaru, 4,572,626, Cl. 350-634.000.

Kabushiki Kaisha Toshiba: *See—*
Inoue, Hiroshi; Tsuge, Akihiko; and Komeya, Katsutoshi, 4,572,844, Cl. 427-180.000.
Karino, Hisao, 4,572,935, Cl. 219-10.55B.
Koga, Takashi, 4,573,022, Cl. 330-307.000.
Saito, Masayuki; Suzuki, Haruko; and Oodaira, Hirosi, 4,572,843, Cl. 427-53.100.
Tanaka, Shigeru; and Onodera, Toshihiro, 4,573,184, Cl. 378-110.000.

Kaganowicz, Grzegorz; and Robinson, John W., to RCA Corporation. Low temperature method of deposition silicon dioxide. 4,572,841, Cl. 427-39.000.

Kai, Mutsunori: *See—*
Ikeda, Noriaki; Kai, Mutsunori; and Asai, Hiraki, 4,572,451, Cl. 242-56.00R.

Kaieda, Osamu; Hirota, Koichi; Okitaka, Isao; and Nakamura, Toshiaki, to Nippon Shokubai Kagaku Kogyo Co., Ltd. 2,3,5,6-Tetrafluorophenyl (meth) acrylates and method for production thereof. 4,572,805, Cl. 260-465.00D.

Kaiser, Hans-Peter: *See—*
Fleming, Gunter; Grothe, Horst; Haselhuhn, Rolf; and Kaiser, Hans-Peter, 4,572,277, Cl. 164-436.000.

Kaiser, Roman; and Lamparsky, Dietmar, to Givaudan Corporation. Odorant substances. 4,572,795, Cl. 252-522.00R.

Kaiser, Walter L. Peanut hull thermal insulation. 4,572,815, Cl. 264-115.000.

Kajiki, Minoru: *See—*
Ikemura, Akio; and Kajiki, Minoru, 4,572,282, Cl. 165-54.000.

Kakuta, Toshio; and Kjkuchi, Toshio, to Hosiden Electronics Co., Ltd. Multiple switch using a rotary actuator. 4,572,930, Cl. 200-5.00R.

Kalinowski, Robert E.: *See—*
Graiver, Daniel; and Kalinowski, Robert E., 4,572,917, Cl. 521-68.000.

Kalus, Peter; and Wippern, Gerhard, to Esselte Pendaflex Corporation. Label tape. 4,572,855, Cl. 428-43.000.

Kamada, Koichiro, to Omron Tateisi Electronics Co. Assembling construction of electronic apparatus. 4,573,104, Cl. 361-399.000.

Kamai, Kenichiro; Omori, Norio; Kinugawa, Masumi; and Takao, Mitsunori, to Nippondenso Co., Ltd. Method of controlling internal combustion engine. 4,572,122, Cl. 123-206.000.

Kameta, Yasuaki: *See—*
Fujita, Mamoru; and Kameta, Yasuaki, 4,572,359, Cl. 198-819.000.

Kaminaga, Hiromitsu, to Yoshida Kogyo K.K. Method of mounting curtain wall units and constructions thereof. 4,571,905, Cl. 52-235.000.

Kaminow, Ivan P., to AT&T Bell Laboratories. Longitudinal mode stabilized laser. 4,573,163, Cl. 372-96.000.

Kamp, Heinz; and Zitzen, Wilhelm, to W. Schlafhorst & Co. Controllable and adjustable yarn tensioner. 4,572,459, Cl. 242-150.00R.

Kanazawa, Hirotaka; Teruhiko, Takatani; Shigeki, Furutani; Chikuma, Isamu; Shimada, Satoru; and Eda, Hiroshi, to Mazda Motor Corporation. Four-wheel steering system for vehicle. 4,572,316, Cl. 180-143.000.

Kanegafuchi Kagaku Kogyo Kabushiki Kaisha: *See—*
Fushiki, Yasuo; Abe, Masaharu; and Oizumi, Masayuki, 4,572,859, Cl. 428-215.000.

Kanehori, Keiichi; Miyauchi, Katsuki; and Kudo, Tetsuichi, to Hitachi, Ltd. Titanium disulfide thin film and process for fabricating the same. 4,572,873, Cl. 428-432.000.

Kaneko, Naotomo: *See—*
Kanno, Samon; Kaneko, Naotomo; and Kozaki, Takaharu, 4,571,968, Cl. 72-331.000.

Kaneko, Nobutaka, to Olympus Optical Co., Ltd. Densitometer for an electrophoresis apparatus. 4,572,671, Cl. 356-444.000.

Kanemaki, Koji: *See—*
Hanyu, Susumu; Koide, Akio; and Kanemaki, Koji, 4,572,090, Cl. 112-153.000.

Kanemitsu, Shinji: *See—*
Toriumi, Mototada; and Kanemitsu, Shinji, 4,572,648, Cl. 355-3.0FU.

Kanno, Samon; Kaneko, Naotomo; and Kozaki, Takaharu, to Sango Jyuki Kabushiki Kaisha. Steel frame shearing apparatus. 4,571,968, Cl. 72-331.000.

Kanzaka, Yoshihiro; and Ito, Masahiko, to Nippon Notion Kogyo Co., Ltd. Drainable button assembly. 4,571,781, Cl. 24-95.000.

Kanzaki, Hisao: *See—*
Imai, Masanori; and Kanzaki, Hisao, 4,572,889, Cl. 430-302.000.

Kanzaki Paper Mfg. Co., Ltd.: *See*—
Tanaka, Kenmei, 4,572,686, Cl. 400-621.100.
Kao, Yu C.; and Leslie, Scott G., to Westinghouse Electric Corp. Triggering method for light triggered thyristors. 4,572,947, Cl. 250-211.00J.
Kapp, Gregory W.; and Van Kirk, LeRoy, to LRV Corporation. Truck bed liner securing device. 4,572,568, Cl. 296-39.00R.
Karino, Hisao, to Kabushiki Kaisha Toshiba. Cooking apparatus having an initial temperature setting function. 4,572,935, Cl. 219-10.55B.
Karl Mayer Textilmaschinenfabrik GmbH: *See*—
Fiedler, Hans, 4,571,956, Cl. 66-84.00A.
Kasai, Kazumi, to Nippon Notion Kogyo Co., Ltd. Adjustable strap fastener. 4,571,783, Cl. 24-200.000.
Kasai, Shunichi: *See*—
Ogata, Takashi; Tasaki, Hiroshi; and Kasai, Shunichi, 4,572,823, Cl. 423-49.000.
Kasai, Touru: *See*—
Yamanobe, Ken; Arai, Hiroyuki; and Kassi, Touru, 4,572,997, Cl. 318-349.000.
Kassai Kabushikikaisha: *See*—
Kassai, Kenzou, 4,571,760, Cl. 5-99.00R.
Kassai, Kenzou, to Kassai Kabushikikaisha. Carry-cot. 4,571,760, Cl. 5-99.00R.
Kassner, Jochen; and Schreiber, Friedrich. Hair clipper. 4,571,830, Cl. 30-200.000.
Kasugai, Joji; Kuniyoshi, Toru; and Toki, Satoshi, to Toyoda Gosei Co., Ltd. Cap with valve. 4,572,396, Cl. 220-203.000.
Kasukave, Tetsuro, to Clarion Co., Ltd. Intermittent link mechanism. 4,572,013, Cl. 74-50.000.
Kasuya, Takahira: *See*—
Sato, Keiji; Kasuya, Takahira; Yamakawa, Goichi; and Wada, Tsuneo, 4,572,885, Cl. 430-99.000.
Kataoka, Hiroyuki; Yamada, Masanori; and Suzuki, Nobuyuki, to Canon Kabushiki Kaisha. Computer type electronic flash device. 4,572,644, Cl. 354-415.000.
Katashima, Seiji, to Naniwa Products Co. Ltd. Blow plate and/or blow nozzle automatic cleaning device. 4,572,273, Cl. 164-158.000.
Katayama, Nobuaki, to Toyota Jidosha Kabushiki Kaisha. Synchronizer of transmission for vehicles. 4,572,020, Cl. 74-477.000.
Katayama, Yoshio, to Hitachi Metals, Ltd. Rotary plug valve. 4,572,231, Cl. 137-246.150.
Kato Hatsujo Kaisha Limited: *See*—
Yamaguchi, Noboru; and Ito, Kiichiro, 4,572,466, Cl. 248-73.000.
Katscher, Erich; Stoss, Johannes; Weber, Robert; Zoberlein, Dieter; Weber, Jakob; and Forster, Josef, to Kraftwerk Union Aktiengesellschaft. Tube lane manipulator, spraying head and corresponding spraying method for the high-pressure blowdown of heat exchangers. 4,572,284, Cl. 165-95.000.
Katsura, Yuji: *See*—
Sato, Nobuhiro; Katsura, Yuji; and Ueno, Haruyuki, 4,572,828, Cl. 423-344.000.
Katzer, Johann; Lopic, Franz; Sauer, Roland; and Stephany, Christian, to Gardena Kress & Kastner GmbH. Mixing apparatus. 4,572,235, Cl. 137-268.000.
Kawabata, Yasuhiro: *See*—
Inada, Masami; Kawabata, Yasuhiro; and Akagi, Motonobu, 4,571,945, Cl. 60-602.000.
Kawaguchi, Hiroshi: *See*—
Konishi, Masataka; Sugawara, Koko; Miyaki, Takeo; and Kawaguchi, Hiroshi, 4,572,895, Cl. 435-75.000.
Kawahara, Masafumi, to Sharp Kabushiki Kaisha. Abnormal condition detecting system in an electronic thermometer. 4,572,213, Cl. 128-736.000.
Kawai, Hisasi: *See*—
Nakano, Osamu; Ina, Toshikazu; and Kawai, Hisasi, 4,572,963, Cl. 307-10.00R.
Kawakami, Kenji: *See*—
Horikawa, Kenichi; Yamamoto, Yoshinori; and Kawakami, Kenji, 4,572,461, Cl. 242-198.000.
Kawakita, Mayuto, to Sansin Kiko Co. Ltd. XYZ Vise. 4,572,492, Cl. 269-75.000.
Kawamura, Hideaki: *See*—
Nozawa, Ryoichiro; Kawamura, Hideaki; and Miyata, Mitsuto, 4,572,998, Cl. 318-572.000.
Kawana, Takeshi: *See*—
Saito, Hiroshi; Okayasu, Hiromasa; Tsuyuki, Shinichi; Kawana, Takeshi; Mifune, Takao; and Yoshizaki, Masanori, 4,571,822, Cl. 29-736.000.
Kawashima, Yonesaburo, to Tochigi Seiko Co., Ltd. Toothbrush. 4,571,768, Cl. 15-167.00R.
Kaya, Denise A.: *See*—
Rogers, Steven H.; Mundt, Randall S.; and Kaya, Denise A., 4,571,819, Cl. 29-576.00W.
Kearney, Avery L.: *See*—
Groteke, Daniel E.; and Kearney, Avery L., 4,572,486, Cl. 266-229.000.
Keck, Jurgen: *See*—
Krutz, Ferdinand; Keck, Jurgen; Bolingen, Johann; and Wetzler, Herbert, 4,571,848, Cl. 33-544.000.
Keil, Enrique: *See*—
Leale, Luis; Saunders, Edward A.; and Keil, Enrique, 4,572,990, Cl. 315-220.000.
Keller Structures, Inc.: *See*—
Berghuis, Thomas G.; and Propson, James A., 4,571,909, Cl. 52-309.800.
Kelley, James O.: *See*—
DeFouw, Jerry A.; and Kelley, James O., 4,571,907, Cl. 52-239.000.
Kelman, Charles D. Surgical operating room structure. 4,571,900, Cl. 52-65.000.
Kemper, Yves J., to Caterpillar Tractor Co. Nutating traction drive transmission. 4,572,015, Cl. 74-191.000.
Kepple, Larry G.; and Smith, Samuel L., to Professional Associated Consulting Engineers Incorporated. Flow measuring apparatus. 4,571,997, Cl. 73-215.000.
Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung: *See*—
Krutz, Ferdinand; Keck, Jurgen; Bolingen, Johann; and Wetzler, Herbert, 4,571,848, Cl. 33-544.000.
Kerr, Fred. Apparatus for mounting sheet material and mounting assembly and structural surface formed therewith. 4,571,897, Cl. 52-13.000.
Kessler, Laibe A.; and Walsh, Jean M., to Allegheny-Singer Research Corporation. Patient enclosure. 4,571,904, Cl. 52-205.000.
Kessler, Peter; and Mayer, Jurgen, to Robert Bosch GmbH. Windshield wiper device for motor vehicles. 4,571,770, Cl. 15-250.420.
Keszler, Jozsef: *See*—
Sooki-Toth, Gabor; Horvath, Pal; Jedlovszky, Palne ; Keszler, Jozsef; and Sors, Laszlo , 4,572,793, Cl. 252-182.100.
Kidode, Masatsugu; and Kuno, Yoshinori, to Tokyo Shibaura Denki Kabushiki Kaisha. Stereoscopic vision system. 4,573,191, Cl. 382-1.000.
Kieser, Jorg: *See*—
Aichert, Hans; Kieser, Jorg; and Kukla, Reiner, 4,572,776, Cl. 204-298.000.
Kigasawa, Kazuo; Shimizu, Hiroaki; Hayashi, Toshihiro; Watabe, Kazuo; Tanizaki, Akira; Koyama, Osamu; Wakisaka, Kikuo; and Ogawa, Yasuaki, to Grelan Pharmaceutical Co., Ltd. Soft buccal. 4,572,832, Cl. 424-19.000.
Kikuchi, Junzo: *See*—
Nishimura, Tomio; Kikuchi, Junzo; Sugiura, Ryuzo; and Yoshida, Toshiro, 4,572,928, Cl. 179-99.00A.
Kikuchi, Juro, to Olympus Optical Co., Ltd. Zoom lens system. 4,572,620, Cl. 350-427.000.
Kikuchi, Toshio: *See*—
Kakuta, Toshio; and Kikuchi, Toshio, 4,572,930, Cl. 200-5.00R.
Kim, Bang M., to General Electric Company. Process for recovery of zirconium and acid from spent etching solutions. 4,572,824, Cl. 423-70.000.
Kimberly-Clark Corporation: *See*—
Drost, Adrian D.; and Ruscher, Edward H., 4,572,521, Cl. 277-167.500.
Kinefac Corp.: *See*—
Greis, Howard A.; and Garniewicz, Charles A., 4,571,972, Cl. 72-98.000.
King, Christopher C., to Monroe Systems for Business, Inc. Tester for a copier. 4,572,661, Cl. 355-3.0DD.
King, Michael H., to Lisle Corporation. Radiator hose separator pliers construction. 4,571,808, Cl. 29-268.000.
Kinley, Karl S., to J. C. Kinley Co. Time-delayed ignition system for a down-hole explosive tool. 4,572,288, Cl. 166-63.000.
Kino, Gordon S.: *See*—
Bowers, John E.; and Kino, Gordon S., 4,572,949, Cl. 250-227.000.
Kinugasa, Yukio; and Yaegashi, Takehisa, to Toyota Jidosha Kogyo Kabushiki Kaisha. Speed change control method and device of automatic transmission for vehicle. 4,572,029, Cl. 74-866.000.
Kinugawa, Masumi: *See*—
Abe, Tomoaki; Kinugawa, Masumi; and Suzuki, Atsushi, 4,571,991, Cl. 73-118.000.
Kamai, Kenichiro; Omori, Norio; Kinugawa, Masumi; and Takao, Mitsunori, 4,572,122, Cl. 123-206.000.
Kinzler, Jack A. Rethreading die and method. 4,572,032, Cl. 76-101.00B.
Kioritz Corporation: *See*—
Nagashima, Akira, 4,571,833, Cl. 30-381.000.
Kipperman, Stuart: *See*—
Bruno, Robert H.; Johns, Robert G.; Kipperman, Stuart; Mayer, Geoffrey R.; Protzmann, Donald E.; and Uhl, Robert F., 4,572,365, Cl. 206-306.000.
Kirchhoff, Kenneth J.; and Lightfoot, Clinton W., to Minnesota Mining and Manufacturing Company. Pen-like instrument for applying correction fluid. 4,572,691, Cl. 401-214.000.
Kirievsky, Boris A.: *See*—
Ioshpa, Vladimir G.; Kirievsky, Boris A.; Kravchenko, Anatoly P.; Kudinov, Gennady A.; Kutsykovich, Dorina B.; Lysenko, Evgeny E.; Shokul, Anatoly A.; Nekrasov, Ignaty N.; Filipiev, Oleg V.; and Lugansky, Vladimir P., 4,572,269, Cl. 164-93.000.
Kishi, Noriyuki: *See*—
Hasegawa, Shumpei; Mishima, Yoshibumi; Kishi, Noriyuki; and Makino, Yuzi, 4,572,141, Cl. 123-339.000.
Kishimoto, Shoji: *See*—
Matsuo, Taisuke, deceased; Ochiai, Michihiko; and Kishimoto, Shoji, 4,572,801, Cl. 260-245.400.
Kita, Toru, to Nissan Motor Company, Limited. Magnetostriction torque sensor. 4,572,005, Cl. 73-862.360.
Kitagawa, Junji; Akita, Sigeyuki; and Yamanoue, Kouichi, to Nippon Soken, Inc. Electric wiring system having a plurality of sensors. 4,573,041, Cl. 340-538.000.
Kitahama, Yoshiharu: *See*—
Yamazoe, Katsuhiko; Yoshino, Akira; Kitahama, Yoshiharu; and Iwami, Isamu, 4,572,803, Cl. 534-16.000.

Kitamura, Shigehiro: *See*—
Nakamura, Masaki; Abe, Takao; Koshizuka, Kunihiro; Kitamura, Shigehiro; Ishii, Fumio; and Hotta, Yuji, 4,572,860, Cl. 428-216.000.

Kitani, Akira: *See*—
Saigo, Tsuyoshi; and Kitani, Akira, 4,573,121, Cl. 364-413.000.

Kitazawa, Eiici: *See*—
Yoshioka, Takao; Kitazawa, Eiici; Kurumada, Tomoyuki; Yamazaki, Mitsuo; and Hasegawa, Kazou, 4,572,912, Cl. 514-369.000.

Kitzes, Arnold S.: *See*—
Driggers, John M.; Saska, Thomas J.; and Kitzes, Arnold S., 4,572,938, Cl. 219-85.0BM.

Klaus, Artur F.; and Piecha, Gottfried, to Signode Corporation. Stapling tool. 4,572,419, Cl. 227-8.000.

Klein, Schanzlin & Becker Aktiengesellschaft: *See*—
Derlich, Hans-Joachim, 4,572,474, Cl. 248-639.000.

Klepsch, Werner: *See*—
Grabler, Wolfgang; and Klepsch, Werner, 4,571,804, Cl. 29-235.000.

Kleveborn, Rolf, to AB Linjebyggnad. Rail assembly with climber shoes and fall-preventing means. 4,572,329, Cl. 182-9.000.

Klever, Manfred; and Rott, Karl-Heinz, to Gutbrod-Werke GmbH. Bulldozing or snowplow blade. 4,571,861, Cl. 37-241.000.

Klose, Odo. to Prasenta KG Weber & Co. Ball-point pen. 4,572,688, Cl. 401-112.000.

Klubitschko, Gerd: *See*—
Knabel, Walter; and Klubitschko, Gerd, 4,572,542, Cl. 280-634.000.

Kluczynski, Paul F., to St. Mary Manufacturing Corp. Elongated screw supporting construction. 4,572,014, Cl. 74-89.150.

Knabel, Walter; and Klubitschko, Gerd, to Marker International. Indicator for safety ski binding. 4,572,542, Cl. 280-634.000.

Knight, Jack D.: *See*—
Duerksen, John H.; Wall, Robert G.; and Knight, Jack D., 4,572,294, Cl. 166-273.000.

Knorrich, Wolf-Dieter: *See*—
Heuberger, Erich; Knorrich, Wolf-Dieter; and Ehrhart, Karl-Josef, 4,572,422, Cl. 229-7.00R.

Knowles, Gary R.: *See*—
Durand, William W.; and Knowles, Gary R., 4,572,958, Cl. 250-495.100.

Kobayashi, Haruo: *See*—
Ishihara, Kazuo; and Kobayashi, Haruo, 4,572,641, Cl. 354-121.000.

Kobayashi, Koji; and Shimizu, Keisuke, to Hokkai Can Co., Ltd.; and Snow Brand Milk Products Co., Ltd. Container with easy open type closure. 4,572,393, Cl. 220-270.000.

Kobayashi, Toyohiro: *See*—
Shinma, Mitsuru; Kobayashi, Toyohiro; Mori, Masahito; Tsuboi, Shunji; and Sugita, Masaru, 4,573,059, Cl. 346-76.0PH.

Kobayashi, Tsuneki: *See*—
Matsumoto, Yoshikane; Kobayashi, Tsuneki; Kurosawa, Makoto; and Seino, Minoru, 4,572,685, Cl. 400-320.000.

Kobelt, Jacob. Brake actuating system. 4,572,335, Cl. 188-72.100.

Koch, Ulrich H.; Williams, Peter C.; and Lutz, Gilbert F., to Whitey Co. High pressure ball valve. 4,572,239, Cl. 137-625.470.

Kocks Technik GmbH & Co.: *See*—
Moltner, Hermann; and Staat, Karl-Hans, 4,571,970, Cl. 72-68.000.

Koenig, Herbert, to Messerschmitt-Boelkow-Blohm Gesellschaft mit beschraenkter Haftung. Flight control system especially for helicopters. 4,573,125, Cl. 364-434.000.

Koepke, Gunther; Frenken, Hans; Bussmann, Heinrich; and Browatzki, Kurt, to Agfa-Gevaert Aktiengesellschaft. Process for the multiple coating of moving webs. 4,572,849, Cl. 427-402.000.

Koerschner, Lou Anne; Sloumb, Robert C.; and Weber, William E., to Conwed Corporation. Tie-off closure for netting products. 4,571,779, Cl. 24-30.5OS.

Koga, Takashi, to Kabushiki Kaisha Toshiba. Semiconductor integrated circuit using vertical PNP transistors. 4,573,022, Cl. 330-307.000.

Koide, Akio: *See*—
Hanyu, Susumu; Koide, Akio; and Kanemaki, Koji, 4,572,090, Cl. 112-153.000.

Koide, Yoshitaka: *See*—
Arita, Kihio; Mitani, Susumu; Sakai, Hideo; Sudo, Yoshikazu; Koide, Yoshitaka; Sato, Haruzi; Habuka, Yoshio; Kozakai, Takashi; and Tanaka, Hiroji, 4,571,999, Cl. 73-598.000.

Koike, Eishi, to Ozen Corporation. Self-holding switch for use in a sound reproducing device. 4,573,150, Cl. 369-67.000.

Koike, Masami: *See*—
Nakamura, Shuji; Koike, Masami; and Yasuki, Shigehiro, 4,572,572, Cl. 296-223.000.

Kojima, Katsumi, to Nippon Air Brake Co., Ltd. Air dryer device. 4,572,725, Cl. 55-274.000.

Kojima, Shigezo: *See*—
Okada, Tokio; Kojima, Shigezo; and Tani, Haruhisa, 4,571,765, Cl. 8-149.300.

Kojima, Shuichi; Nakao, Masashi; Gotoh, Miyuki; Ishido, Takao; and Imamura, Shuichiro, to Nissan Motor Co., Ltd. Warp let-off motion for loom having two warp beams. 4,572,244, Cl. 139-103.000.

Kokawa, Ryoichi: *See*—
Tsunoda, Teruo; and Kokawa, Ryoichi, 4,573,190, Cl. 382-1.000.

Kokusai Denshin Denwa Co., Ltd.: *See*—
Mochizuki, Kiyofumi; and Namihira, Yoshinori, 4,572,608, Cl. 350-96.150.

Kokusai Denshin Denwa Kabushiki Kaisha: *See*—
Sakai, Kazuo; Matsushima, Yuichi; Akiba, Shigeyuki; and Utaka, Katsuyuki, 4,573,161, Cl. 372-45.000.
Utaka, Katsuyuki; Sakai, Kazuo; and Akiba, Shigeyuki, 4,573,158, Cl. 372-32.000.

Kollmorgen Technologies Corporation: *See*—
Coulon, Philip S., Jr., 4,572,999, Cl. 318-618.000.

Kolodin, Louis, to RCA Corporation. Filter circuit for digital-to-analog converter. 4,573,033, Cl. 340-347.0DA.

Komaroff, Iwan: *See*—
Grunwald, Werner; Imhof, Ernst; Komaroff, Iwan; Mayer, Rolf; and Schmid, Gunther, 4,572,146, Cl. 123-549.000.

Komasaku, Seiichi; Iiyama, Hiroshi; Watanabe, Noboru; and Tanaka, Osamu, to Jeco Co., Ltd. Angle change detector. 4,571,844, Cl. 33-366.000.

Komatsu, Isamu; Anzai, Masayasu; and Hoshi, Nobuyoshi, to Hitachi, Ltd. Method for developing an electrostatic latent image in an electrophotographic recording apparatus. 4,572,651, Cl. 355-4.000.

Komatsu, Tokuji, to Tsudakoma Corp. Method of treating warp yarn ends in a sizing process. 4,571,792, Cl. 28-180.000.

Komeya, Katsutoshi: *See*—
Inoue, Hiroshi; Tsuge, Akihiko; and Komeya, Katsutoshi, 4,572,844, Cl. 427-180.000.

Kommoss, Klaus, to U.S. Philips Corporation. Control device for the tape deck of a magnetic tape cassette apparatus. 4,573,088, Cl. 360-71.000.

Komori, Hisao: *See*—
Tada, Mitsuro; Ikegami, Takeshi; and Komori, Hisao, 4,572,652, Cl. 355-14.00R.

Komori Printing Machinery Co., Ltd.: *See*—
Tsunoda, Teruo; and Kokawa, Ryoichi, 4,573,190, Cl. 382-1.000.

Komp, Uwe; Henke, Klaus; and Wozniak, Johannes, to Hoesch Werke AG. Road wheel for a track-laying vehicle. 4,572,587, Cl. 305-56.000.

Kondo, Ryuji: *See*—
Tisue, Gil; and Kondo, Ryuji, 4,573,076, Cl. 358-212.000.

Kondo, Shinichi; Nakaya, Chitose; and Ishikawa, Shizuo, to Hitachi, Ltd. Probe for intraluminal ultrasonic scanner. 4,572,201, Cl. 128-660.000.

Kondo, Shiroh, to Ricoh Company, Ltd. Double sleeve developing device. 4,572,631, Cl. 355-3.0DD.

Kongoh, Takeshi: *See*—
Makabe, Hachiro; and Kongoh, Takeshi, 4,572,095, Cl. 112-456.000.

Konicke, Helmut: *See*—
Politzer, Anton; Heberlein, Werner; and Konicke, Helmut, 4,572,076, Cl. 102-431.000.

Konishi, Masataka; Sugawara, Koko; Miyaki, Takeo; and Kawaguchi, Hiroshi, to Bristol-Myers Company. Process for preparing an antibiotic complex by culturing actinomyces strain ATCC 39417. 4,572,895, Cl. 435-75.000.

Konishiroku Photo Industry Co., Ltd.: *See*—
Nakamura, Issei; and Itozawa, Kenji, 4,572,866, Cl. 428-328.000.
Nakamura, Issei; and Itozawa, Kenji, 4,572,867, Cl. 428-328.000.
Nakamura, Masaki; Abe, Takao; Koshizuka, Kunihiro; Kitamura, Shigehiro; Ishii, Fumio; and Hotta, Yuji, 4,572,860, Cl. 428-216.000.
Sato, Keiji; Kasuya, Takahira; Yamakawa, Goichi; and Wada, Tsuneo, 4,572,885, Cl. 430-99.000.
Shiozawa, Takao, 4,572,498, Cl. 271-34.000.

Konisiroku Photo Industry Co., Ltd.: *See*—
Amano, Tadashi; Sato, Yasuaki; and Ohkoshi, Yasuo, 4,572,657, Cl. 355-38.000.

Konno, Tatsuo, to Canon Kabushiki Kaisha. Motorized winding and rewinding camera. 4,572,636, Cl. 354-173.110.

Kooiman, Robert R., to Rosemount Inc. Pressure sensor with a substantially flat overpressure stop for the measuring diaphragm. 4,572,000, Cl. 73-718.000.

Koomen, Cornelis J., to U.S. Philips Corporation. Binary selector stage and a selector and selector system comprising such selector stages. 4,573,047, Cl. 340-825.670.

Koppers, Manfred: *See*—
Heintzmann, Peter; Koppers, Manfred; Amling, Friedel; and Bohnes, Karlheinz, 4,572,480, Cl. 254-93.00R.

Korenko, Michael K.; Gelles, David S.; and Thomas, Larry E., to United States of America, Energy. Maraging superalloys and heat treatment processes. 4,572,738, Cl. 75-128.00Z.

Korff, William W., to Butler Manufacturing Company. Programmable electronic real-time load controller, and apparatus therefor, providing for updating of preset calendar events. 4,573,127, Cl. 364-493.000.

Kornhaus, Donald C. Weighted foot exerciser. 4,572,505, Cl. 272-96.000.

Kornreich, Philipp G.: *See*—
Kowel, Stephen T.; Kornreich, Philipp G.; and Cleverly, Dennis S., 4,572,616, Cl. 350-335.000.

Koshimo, Masahiko, to Kabushiki Kaisha Daikin Seisakusho. Lock-up clutch of a torque converter. 4,572,339, Cl. 192-3.310.

Koshizuka, Kunihiro: *See*—
Nakamura, Masaki; Abe, Takao; Koshizuka, Kunihiro; Kitamura, Shigehiro; Ishii, Fumio; and Hotta, Yuji, 4,572,860, Cl. 428-216.000.

Kotani, Haruo: *See*—
Sakuragi, Shiro; Saitoh, Mitsunori; Kotani, Haruo; and Imagawa, Kyoshiro, 4,572,609, Cl. 350-96.300.

Koths, Kirston E.; and Halenbeck, Robert F., to Cetus Corporation. Method for promoting disulfide bond formation in recombinant proteins. 4,572,798, Cl. 260-112.00R.

Kowel, Stephen T.; Kornreich, Philipp G.; and Cleverly, Dennis S., to Syracuse University. Adaptive liquid crystal lens. 4,572,616, Cl. 350-335.000.

Koyama, Osamu: *See*—
Kigasawa, Kazuo; Shimizu, Hiroaki; Hayashi, Toshihiro; Watabe, Kazuo; Tanizaki, Akira; Koyama, Osamu; Wakisaka, Kikuo; and Ogawa, Yasuaki, 4,572,832, Cl. 424-19.000.

Kozakai, Takashi: *See*—
Arita, Kishio; Mitani, Susumu; Sakai, Hideo; Sudo, Yoshikazu; Koide, Yoshitaka; Sato, Haruzi; Habuka, Yoshio; Kozakai, Takashi; and Tanaka, Hiroji, 4,571,999, Cl. 73-598.000.

Kozaki, Takaharu: *See*—
Kanno, Samon; Kaneko, Naotomo; and Kozaki, Takaharu, 4,571,968, Cl. 72-331.000.

Kraftwerk Union Aktiengesellschaft: *See*—
Cirkel, Hans-Jurgen; Bette, Willi; and Muller, Reinhard, 4,573,160, Cl. 372-38.000.
Katscher, Erich; Stoss, Johannes; Weber, Robert; Zoberlein, Dieter; Weber, Jakob; and Forster, Josef, 4,572,284, Cl. 165-95.000.

Krajewski, John J., to DeSoto, Inc. Optical fiber buffer coated with halogenated dihydroxy-terminated polybutadienes. 4,572,610, Cl. 350-96.340.

Kramer, Charles F., to Steel Heddle Manufacturing Co. Leno heddle device. 4,572,241, Cl. 139-52.000.

Kramer, L. Jonathan: *See*—
Maltby, Frederick L.; and Kramer, L. Jonathan, 4,573,040, Cl. 340-511.000.

Krasser, Fritz, to Ellenberger & Poensgen GmbH. Push button-actuated overload protective circuit breaker. 4,573,031, Cl. 337-68.000.

Krasuk, Julio; Solari, Rodolfo B.; Aquino, Luis G.; Rodriguez, Jose V.; and Granados, Alejandro, to Intevep S.A. Solvent deasphalting in solid phase. 4,572,781, Cl. 208-309.000.

Kratt, Alfred, to Robert Bosch GmbH. Method of and device for regulating rotary speed of an internal combustion engine. 4,572,125, Cl. 123-325.000.

Kravchenko, Anatoly P.: *See*—
Ioshpa, Vladimir G.; Kirievsky, Boris A.; Kravchenko, Anatoly P.; Kudinov, Gennady A.; Kutsykovich, Dorina B.; Lysenko, Evgeny E.; Shokul, Anatoly A.; Nekrasov, Ignaty N.; Filipiev, Oleg V.; and Lugansky, Vladimir P., 4,572,269, Cl. 164-93.000.

Kreeger, John R.: *See*—
Sanborn, Harold C.; Carago, Frank; and Kreeger, John R., 4,571,983, Cl. 72-462.000.

Kretzschmann, Gunther; Scholz, Dieter; and Hilgert, Karl-Heinz, to Boehringer Ingelheim KG. Citric acid esters as blowing and nucleating agents in the processing plastics. 4,572,740, Cl. 106-122.000.

Kreuzer, Norbert: *See*—
Cappel, Bert; and Kreuzer, Norbert, 4,572,071, Cl. 101-183.000.

Krizik, Jan G., to IDR Enterprises, Inc. Displacement transducer using a movable light shield moved within a predetermined range for linear detector output. 4,572,607, Cl. 356-32.000.

Kronfeld, Marcie. Light bulb package. 4,572,362, Cl. 206-45.140.

Krutz, Ferdinand; Keck, Jurgen; Bolingen, Johann; and Wetzler, Herbert, to Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung. Apparatus for measuring the transverse profile of a drill hole in a geologic formation. 4,571,848, Cl. 33-544.000.

Kubota, Hitoshi, to Nissan Motor Company, Limited. Blow-off valve in a quick take-up master cylinder. 4,571,944, Cl. 60-562.000.

Kubota, Ltd.: *See*—
Osujo, Masahide, 4,571,786, Cl. 74-485.000.

Kudinov, Gennady A.: *See*—
Ioshpa, Vladimir G.; Kirievsky, Boris A.; Kravchenko, Anatoly P.; Kudinov, Gennady A.; Kutsykovich, Dorina B.; Lysenko, Evgeny E.; Shokul, Anatoly A.; Nekrasov, Ignaty N.; Filipiev, Oleg V.; and Lugansky, Vladimir P., 4,572,269, Cl. 164-93.000.

Kudo, Tetsuichi: *See*—
Kanehori, Keiichi; Miyauchi, Katsuki; and Kudo, Tetsuichi, 4,572,873, Cl. 428-432.000.

Kuhn, Ulrich, to Robert Bosch GmbH. Method of determination of supply start in injection pumps. 4,571,992, Cl. 73-119.00A.

Kukla, Reiner: *See*—
Aichert, Hans; Kieser, Jorg; and Kukla, Reiner, 4,572,776, Cl. 204-298.000.

Kunin, Robert; and Salem, Eli, to Graver Company, The. Precoat filter and method for neutralizing sugar syrups. 4,572,742, Cl. 127-46.200.

Kuniyoshi, Toru: *See*—
Kasugai, Joji; Kuniyoshi, Toru; and Toki, Satoshi, 4,572,396, Cl. 220-203.000.

Kuno, Yoshinori: *See*—
Kidode, Masatsugu; and Kuno, Yoshinori, 4,573,191, Cl. 382-1.000.

Kuntzmann, Jean-Claude; Nazet, Rene ; and Tarreau, Louis, to Thomson-CSF. Traveling wave tube comprising a sleeve cut with grooves and its manufacturing process. 4,572,985, Cl. 315-3.500.

Kupersmit, Julius B. Pour spout construction for collapsible containers. 4,572,408, Cl. 222-153.000.

Kupfer, Karl H., to U.S. Philips Corporation. Two-circuit resonant bandpass filter for television tuners. 4,573,211, Cl. 455-188.000.

Kupper, Wilhelm, to W. Schlafhorst & Co. Spinning and winding plant. 4,571,931, Cl. 57-281.000.

Kurakake, Mitsuo; and Sakamoto, Keiji, to Fanuc Ltd. Servomotor control system. 4,573,002, Cl. 318-721.000.

Kuratani, Junichi, to Alps Electric Co., Ltd. Illuminated slide rheostat. 4,573,106, Cl. 362-28.000.

Kureha Kagaku Kogyo Kabushiki Kaisha: *See*—
Sakagami, Teruo; and Arakawa, Noriyuki, 4,572,905, Cl. 502-402.000.

Kurosaki Refractories Co., Ltd.: *See*—
Matano, Taiji; Ueno, Haruyuki; and Fukuda, Kazushige, 4,572,902, Cl. 501-97.000.
Sato, Nobuhiro; Katsura, Yuji; and Ueno, Haruyuki, 4,572,828, Cl. 423-344.000.

Kurosawa, Makoto: *See*—
Matsumoto, Yoshikane; Kobayashi, Tsuneki; Kurosawa, Makoto; and Seino, Minoru, 4,572,685, Cl. 400-320.000.

Kurt, Stangl. Stamping apparatus for providing workpieces with different embossed marks. 4,572,680, Cl. 400-121.000.

Kurumada, Tomoyuki: *See*—
Yoshioka, Takao; Kitazawa, Eiici; Kurumada, Tomoyuki; Yamazaki, Mitsuo; and Hasegawa, Kazou, 4,572,912, Cl. 514-369.000.

Kusenberger, Felix N.; Barton, John R.; and Ferguson, George A., to United States of America, Transportation. Magnetic inspection of reinforcing steel rods in prestressed concrete. 4,573,013, Cl. 324-238.000.

Kutsykovich, Dorina B.: *See*—
Ioshpa, Vladimir G.; Kirievsky, Boris A.; Kravchenko, Anatoly P.; Kudinov, Gennady A.; Kutsykovich, Dorina B.; Lysenko, Evgeny E.; Shokul, Anatoly A.; Nekrasov, Ignaty N.; Filipiev, Oleg V.; and Lugansky, Vladimir P., 4,572,269, Cl. 164-93.000.

Kuwakado, Satosi: *See*—
Tsuge, Noboru; Kuwakado, Satosi; Taguchi, Masahiro; and Yasui, Toshio, 4,572,543, Cl. 280-807.000.

Labelle, H. M. Robert, to Martinray Industries Ltd. Rolling closure bottom seal. 4,571,889, Cl. 49-482.000.

Lack, Andrew J., to Gladson Limited. Battery powered lamp unit and supporting container. 4,573,109, Cl. 362-194.000.

LaCourse, John R., to University of New Hampshire. System to determine arterial occlusion and other maladies. 4,572,199, Cl. 128-657.000.

Ladt, Carroll H.: *See*—
Ladt, Max A.; and Ladt, Carroll H., 4,572,086, Cl. 110-347.000.

Ladt, Max A.; and Ladt, Carroll H., to Convenient Energy, Inc. Fine fuel delivery system with remote drying and on site storage. 4,572,086, Cl. 110-347.000.

Lahoda, Erwin: *See*—
Schleich, Jean-Baptiste; Lahoda, Erwin; Lickes, Jean-Paul; and Reuter, Emile, 4,571,913, Cl. 52-722.000.

L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude: *See*—
Gervais, Pierre P.; and Simon, Bernard, 4,572,402, Cl. 220-465.000.

Laker, Edward B. Apparatus for profiling reeds for double-reed musical instruments. 4,572,257, Cl. 144-115.000.

Lamarche, Raymond B.; Bhandari, Baldev; Desaultels, Remi; and Drolet, Pierre, to Les Caoutchoucs Acton Ltee. Anti-skidding sole. 4,571,852, Cl. 36-32.00R.

Lamparsky, Dietmar: *See*—
Kaiser, Roman; and Lamparsky, Dietmar, 4,572,795, Cl. 252-522.00R.

Laney, Roy N. Portable walking beam pump jack. 4,572,012, Cl. 74-41.000.

Lang, Winfried; Griesshammer, Rudolf; Schwab, Michael; and Zulehner, Werner, to Wacker-Chemitronic Gesellschaft fur Elektronik-Grundstoffe mbH. Method for producing articles of high-purity synthetic quartz glass. 4,572,729, Cl. 65-18.100.

Lange, Dieter; and Deptolla, Bernd, to P. A. Rentrop Hubbert & Wagner Fahrzeugausstattungen GmbH & Co. KG. Seats. 4,572,468, Cl. 248-394.000.

Lange, Gerhard, to Wafios Maschinenfabrik GmbH & Co. KG. Apparatus for the manufacture of wire net fabric. 4,572,249, Cl. 140-92.600.

Langer, Alois A.: *See*—
Mirowski, Mieczyslaw; Mower, Morton M.; and Langer, Alois A., 4,572,191, Cl. 128-419.00D.

Langevin, Donald R. Ladder for boarding small boats. 4,572,330, Cl. 182-206.000.

Langwell, John D., to Alexander, Herman. Pad holder adapted for multiple modes of mounting and associated methods. 4,572,380, Cl. 211-57.100.

Lanier, Tyre C.; and Akahane, Takayuki, to North Carolina State University. Method of retarding denaturation of meat products. 4,572,838, Cl. 426-643.000.

Lansinger, Jere R.: *See*—
Chapelsky, Orest, 4,572,097, Cl. 116-227.000.

La Patra, Charles L.: *See*—
Boyd, Robert C.; and La Patra, Charles L., 4,573,042, Cl. 340-539.000.

Larson, Richard E.; Nelson, Dale K.; and Mathison, Allen D., to Cherne Industries, Inc. Connector valve assembly for inflatable packer device. 4,572,228, Cl. 137-15.000.

LaRue, Adrian J. Portable seat having slidable leg-supporting sections for leg amputees. 4,572,577, Cl. 297-430.000.

Laskin, William. Humidification device for musical instruments. 4,572,051, Cl. 84-453.000.

Lathim, Delbert L., to Lathim Industries, Inc. Christmas tree stand. 4,571,881, Cl. 47-40.500.

Lathim Industries, Inc.: *See*—
Lathim, Delbert L., 4,571,881, Cl. 47-40.500.

Laurel Bank Machine Co., Ltd.: *See*—
Furuya, Katusuke; and Sakurai, Tomonari, 4,572,349, Cl. 194-318.000.

Laurin, Jacques: *See*—
Antoine, Robert; and Laurin, Jacques, 4;572,077, Cl. 102-439.000.

Lavenz, James M.: *See—*
McMahon, Michael F., Jr.; and Lavenz, James M., 4,573,171, Cl. 375-114.000.

Lazzara, Ralph: *See—*
Jackman, Warren M.; and Lazzara, Ralph, 4,572,192, Cl. 128-419.0PG.

Leale, Luis; Saunders, Edward A.; and Keil, Enrique, to International Energy Conservation Systems. Electronic transformer system for neon lamps. 4,572,990, Cl. 315-220.000.

LeBlanc, Oliver H., Jr., to General Electric Company. Method for providing uranium hydroxide on UO_2 particles prior to generation of fugitive binder for sintering. 4,572,810, Cl. 264-0.500.

Le Bras, Philippe A. Packaging machine and method. 4,571,923, Cl. 53-398.000.

Le Cacheux, Paul; Schuch, Andre; and Perrot, Alain C., to Ville de Paris. Sales boutique, especially a newspaper kiosk. 4,571,898, Cl. 52-36.000.

LeClair, Louis. Ice fishing device. 4,571,876, Cl. 43-17.000.

Lee, Aaron. Container with inflatable, floating liner of uniform thickness. 4,573,202, Cl. 383-3.000.

Lee, Chi-Long; and Rabe, James A., to Dow Corning Corporation. Foamable polyorganosiloxane compositions. 4,572,918, Cl. 521-91.000.

Lee, Chin-Piao. Vibrissa cutters. 4,571,827, Cl. 30-29.500.

Lee, Steven N., to ASQ Boats, Inc. Side lifting wafer boat assembly. 4,572,101, Cl. 118-500.000.

Lee, Wen-Hsin. Cork screw. 4,572,034, Cl. 81-3.290.

le Faou, Daniel: *See—*
Bernard, Jean; Beyl, Jean; le Faou, Daniel; Peyre, Henri; and Viodet, Patrice, 4,572,541, Cl. 280-628.000.

Lefebvre, Jean-Paul; and Pedron, Thierry, to Regie Nationale des Usines Renault; and Lefebvre, Jean-Paul. Process and device for measuring the state of charge of an electrochemical generator while operating. 4,573,126, Cl. 364-481.000.

Le Foll, Jean: *See—*
Bouko, Jean; Durand, Jean-Claude; Le Foll, Jean; and Salvat, Francois, 4,573,054, Cl. 343-786.000.

Legg, Graham J.: *See—*
Embrey, Derek M.; Webb, Stuart F.; and Legg, Graham J., 4,572,987, Cl. 315-77.000.

Leggett & Platt, Incorporated: *See—*
Stevens, John E., 4,571,755, Cl. 5-13.000.

Leibinger, Berthold, to Trumpf America, Inc. Installation comprising automatic machine tooling and sorting apparatus. 4,571,810, Cl. 29-412.000.

Leischer, Douglas A. Notched ditcher chain tooth. 4,571,859, Cl. 37-191.00A.

Leland Stanford Junior University, The Board of Trustees of the: *See—*
Bowers, John E.; and Kino, Gordon S., 4,572,949, Cl. 250-227.000.
Tuckerman, David B.; and Pease, Roger F. W., 4,573,067, Cl. 357-82.000.

Lenard, Roger: *See—*
Botts, Thomas E.; Powell, James R.; and Lenard, Roger, 4,572,285, Cl. 165-104.280.

Lentz, William L., to De Soto, Inc. Fireplace screen assembly. 4,572,156, Cl. 126-140.000.

Leonard, George H., to Airpot Corporation. Counterbalance device and torsion member usable therein. 4,571,775, Cl. 16-298.000.

Leonard, Ronald J.; and Johnson, Kenneth M., to Omnis Surgical Inc. Process for making a fiber bundle. 4,572,446, Cl. 242-7.020.

LeRoux, Paul. Bicycle lock. 4,571,965, Cl. 70-227.000.

Les Caoutchoucs Acton Ltee: *See—*
Lamarche, Raymond B.; Bhandari, Baldev; Desaultels, Remi; and Drolet, Pierre, 4,571,852, Cl. 36-32.00R.

Lescoffit, Claude, to Compagnie Generale des Etablissements Michelin. Single-piece rim having tire mounting notch, and method of mounting the tire thereon. 4,572,265, Cl. 152-379.300.

Lesh, Jerry H. Outfit of insulated clothing for infants. 4,571,744, Cl. 2-111.000.

Leslie, Scott G.: *See—*
Kao, Yu C.; and Leslie, Scott G., 4,572,947, Cl. 250-211.00J.

Letterio, Fred, to Sweeney, Paul L., Jr. Subarachnoid bolts. 4,572,212, Cl. 128-748.000.

Leu, Don J., to I Ling Industry Co., Ltd. Cutting torch. 4,572,483, Cl. 266-48.000.

Levine, Stephen N., to Motorola, Inc. Unitary phase and frequency adjust network for a multiple frequency digital phase locked loop. 4,573,017, Cl. 328-155.000.

Lewinter, Sidney W., to Aerospace Corporation, The. Digital to analog converter. 4,573,188, Cl. 381-46.000.

Lewis, Brian G.; and Patton, John V., to Olin Corporation. Electromagnetic shaping of thin ribbon conductor strip cast onto a chill wheel. 4,572,279, Cl. 164-463.000.

Lewis, Harold M.: *See—*
Stein, Carl; and Lewis, Harold M., 4,572,267, Cl. 160-176.00R.

Lewis, Henry G., Jr., to RCA Corporation. Chrominance fine gain control in a digital television receiver. 4,573,069, Cl. 358-27.000.

Leybold-Heraeus GmbH: *See—*
Aichert, Hans; Kieser, Jorg; and Kukla, Reiner, 4,572,776, Cl. 204-298.000.
Dietrich, Anton; Hartig, Klaus; and Scherer, Michael, 4,572,842, Cl. 427-39.000.

Licinvest AG: *See—*
Ackeret, Peter, 4,571,865, Cl. 40-10.00R.

Lickes, Jean-Paul: *See—*
Schleich, Jean-Baptiste; Lahoda, Erwin; Lickes, Jean-Paul; and Reuter, Emile, 4,571,913, Cl. 52-722.000.

Liebetrau, Richard E. Panel mounting system and method for mounting panels. 4,571,902, Cl. 52-127.200.

Lightfoot, Clinton W.: *See—*
Kirchhoff, Kenneth J.; and Lightfoot, Clinton W., 4,572,691, Cl. 401-214.000.

Lin, Banchien. Coil density modulation. 4,573,001, Cl. 318-695.000.

Lin, Yung-Mao; and Autry, James C., to Autry Industries, Inc. Double laced athletic shoe. 4,571,856, Cl. 36-89.000.

Lindley, Michael G.; and Hathaway, Steven, to Tate & Lyle Public Limited Co. Tablets. 4,572,916, Cl. 514-777.000.

Lindquist, Kenneth L., to Polaroid Corporation. Method and apparatus for simultaneously loading a plurality of tape cassettes. 4,572,450, Cl. 242-56.00R.

Lindskog, Clas G., to Instrumentverken Aktiebolag. Device for preventing error in a compass. 4,571,843, Cl. 33-355.00R.

Lineman, Harry L.: *See—*
Gaudet, James L.; Lineman, Harry L.; Chukran, Rudolph E.; Neuman, Grover H.; and Barnes, Johnny G., 4,573,138, Cl. 364-900.000.

Lipo, Thomas A., to Wisconsin Alumni Research Foundation. AC Machine optimized for converter operation. 4,573,003, Cl. 318-722.000.

Lipsky, Stephen E., to American Electronic Laboratories, Inc. Integrated receiver antenna device. 4,573,212, Cl. 455-282.000.

Lischka, Helga, geb. Woitzik. Herb package. 4,572,360, Cl. 206-0.500.

Lischke, Burkhard, to Siemens Aktiengesellschaft. Method for the contact-free testing of microcircuits or the like with a particle beam probe. 4,573,008, Cl. 324-158.00R.

Lisfeld, Robert; and Diehl, Edwin, to Ernst Leitz Wetzlar GmbH. Condenser housing for microscopes. 4,572,614, Cl. 350-315.000.

Lisiecki, Robert E., to Ex-Cell-O Corporation. Paperboard container with internal raw edge protection and method for constructing same. 4,572,426, Cl. 229-48.0SA.

Lisle Corporation: *See—*
King, Michael H., 4,571,808, Cl. 29-268.000.
Pool, James L., 4,572,332, Cl. 184-15.100.

Litton Systems, Inc.: *See—*
Anderson, Robert H., 4,573,198, Cl. 382-31.000.

Liu, Keh-Chang: *See—*
Mantarro, Joseph; Liu, Keh-Chang; and Dempsey, Barry J., 4,572,700, Cl. 404-35.000.

Livesay, Billy R.; Tatum, Howard J.; and Toews, Melvin R., to Ortho Pharmaceutical (Canada) Ltd. Method for the detection, location and extraction of an intrauterine device. 4,572,162, Cl. 128-1.00R.

Livingston, James J.; and Sorli, Duncan C., to Polaroid Corporation. Method of and system for identifying subjects. 4,572,634, Cl. 354-84.000.

Lockheed Corporation: *See—*
Rogers, Philip L., 4,572,667, Cl. 356-317.000.

Lodder, Bernhard: *See—*
Guettouche, Ali; and Lodder, Bernhard, 4,572,523, Cl. 277-207.00A.

Lofgren, Michael S.: *See—*
Stewart, Brian C.; and Lofgren, Michael S., 4,572,535, Cl. 280-282.000.

Logan, Otis: *See—*
Smith, John H.; and Logan, Otis, 4,572,782, Cl. 209-236.000.

Londrigan, Michael E., to Jim Walter Resources, Inc. Unsaturated polyoxyalkylene adduct/fumarate diester reaction product for cellular foam stabilization. 4,572,919, Cl. 521-115.000.

Long, Howard W. Method and apparatus for removing ice from paved surfaces. 4,571,860, Cl. 37-197.000.

Looney, Mark D.: *See—*
Thigpen, Arnold B., Jr.; Looney, Mark D.; and Fader, Philip D., 4,572,297, Cl. 166-307.000.

Loosen, Peter: *See—*
Bakowsky, Lothar; Beyer, Eckhard; Herziger, Gerd; and Loosen, Peter, 4,573,162, Cl. 372-61.000.

Lopez, John D., Jr. Security mechanism for pipe flanges. 4,571,966, Cl. 70-232.000.

Lopic, Franz: *See—*
Katzer, Johann; Lopic, Franz; Sauer, Roland; and Stephany, Christian, 4,572,235, Cl. 137-268.000.

Lothmann, Josef: *See—*
Hannes, Heinz D.; Lothmann, Josef; and Walther, Ludwig, 4,572,054, Cl. 91-1.000.

Louis Vuitton, S.A.: *See—*
Grenier, Jean, 4,572,401, Cl. 220-335.000.

Louks, John W.: *See—*
Pastor, Sheldon L.; and Louks, John W., 4,573,097, Cl. 360-135.000.

Lounsberry, Brian D.; and Meade, Robert W., to General Electric Company. X-Ray tube with low off-focal spot radiation. 4,573,185, Cl. 378-125.000.

Love, Robert P.: *See—*
Baliga, Bantval J.; and Love, Robert P., 4,571,815, Cl. 29-571.000.

LRV Corporation: *See—*
Kapp, Gregory W.; and Van Kirk, LeRoy, 4,572,568, Cl. 296-39.00R.

Lubriquip - Houdaille, Inc.: *See—*
Powell, John H.; and Callahan, James J., 4,572,331, Cl. 184-7.400.

Lucas Industries public limited company: *See—*
Mowbray, Dorian F., 4,572,138, Cl. 123-450.000.
Nicol, Stuart W., 4,572,124, Cl. 123-300.000.

Lugansky, Vladimir P.: *See*—
Ioshpa, Vladimir G.; Kirievsky, Boris A.; Kravchenko, Anatoly P.; Kudinov, Gennady A.; Kutsykovich, Dorina B.; Lysenko, Evgeny E.; Shokul, Anatoly A.; Nekrasov, Ignaty N.; Filipiev, Oleg V.; and Lugansky, Vladimir P., 4,572,269, Cl. 164-93.000.

LUK Lamellen und Kupplungsbau GmbH: *See*—
Frietsch, Kurt, 4,572,345, Cl. 192-106.200.
Maucher, Paul, 4,572,341, Cl. 192-13.00R.

Luker, Edward, to Sunbeam Plastics Corporation. Tamper indicating child resistant threaded closure. 4,572,385, Cl. 215-216.000.

Luker, Edward; and Wright, David M., to Sunbeam Plastics Corporation. Screw-type safety cap. 4,572,387, Cl. 215-252.000.

Luker, Edward; and Wright, David M., to Sunbeam Plastics Corporation. Tamper indicating screw cap. 4,572,388, Cl. 215-252.000.

Lurssen, Klaus: *See*—
Berg, Dieter; Reiser, Wolf; and Lurssen, Klaus, 4,572,734, Cl. 71-72.000.

Lusk, Kenneth P. Motion converter. 4,572,027, Cl. 74-812.000.

Lutz, Gilbert F.: *See*—
Koch, Ulrich H.; Williams, Peter C.; and Lutz, Gilbert F., 4,572,239, Cl. 137-625.470.

Lux, Andrew L.: *See*—
Flemings, Merton C.; and Lux, Andrew L., 4,572,818, Cl. 420-590.000.

Lyman, Hugh M., Jr. Telescoping seating assembly. 4,571,895, Cl. 52-9.000.

Lynk, Chuck: *See*—
Smith, Paul F.; Schorman, Eric; Burke, Tim; and Lynk, Chuck, 4,573,207, Cl. 455-54.000.

Lysenko, Evgeny E.: *See*—
Ioshpa, Vladimir G.; Kirievsky, Boris A.; Kravchenko, Anatoly P.; Kudinov, Gennady A.; Kutsykovich, Dorina B.; Lysenko, Evgeny E.; Shokul, Anatoly A.; Nekrasov, Ignaty N.; Filipiev, Oleg V.; and Lugansky, Vladimir P., 4,572,269, Cl. 164-93.000.

M.A.N.-Roland Druckmaschinen Aktiengesellschaft: *See*—
Cappel, Bert; and Kreuzer, Norbert, 4,572,071, Cl. 101-183.000.
Mitze, Rudolf; and Simeth, Claus, 4,572,073, Cl. 101-350.000.

Maag Gear-Wheel and Machine Company Limited: *See*—
Donner, Meinrad, 4,571,891, Cl. 51-165.870.
Sigg, Hans, 4,572,442, Cl. 241-117.000.

Maben, Duane K., to Sperry Corporation. Ribbon cable wire end forming tool. 4,572,250, Cl. 140-105.000.

Mabuchi, Akira; and Yano, Kenji, to Toyoda Gosei Co., Ltd. Glass-run for window glass of motor car. 4,572,871, Cl. 428-423.100.

Mabuchi, Akira: *See*—
Yamazaki, Yoshio; Mabuchi, Akira; and Yano, Kenji, 4,572,872, Cl. 428-423.100.

Mabuchi, Kenichi, to Bio Mabuchi Co. Ltd. Self-travelling vibration generator. 4,572,166, Cl. 128-52.000.

Machinefabriek G.J. Nijhuis B.V.: *See*—
Nijhuis, Johan W., 4,571,777, Cl. 17-1.00E.

MacKenzie, David J.: *See*—
Chestnut, William R.; Parcell, Clive L.; Cox, Christopher J.; and MacKenzie, David J., 4,572,346, Cl. 192-134.000.

Mackson, Richard G. Film processing apparatus including a control system. 4,572,639, Cl. 354-322.000.

MacPherson, Donald H. Compound bow draw position indicating device. 4,572,153, Cl. 124-88.000.

Madate, Haruhisa; Matsumura, Isao; and Sekiguchi, Kyoji, to Canon Kabushiki Kaisha. Eye fundus camera. 4,572,627, Cl. 351-206.000.

Maeda, Masaya; Hirata, Noritsugu; and Takimoto, Hiroyuki, to Canon Kabushiki Kaisha. Recording and reproducing apparatus. 4,573,089, Cl. 360-77.000.

Maeda, Minoru; Iwasaki, Masayuki; and Shinozaki, Fumiaki, to Fuji Photo Film Co., Ltd. Photopolymerizable composition with adhesion improving additive. 4,572,888, Cl. 430-288.000.

Maeshiba, Sozaburo. Lock system preventing mixing of different kinds of oil at gasoline stand. 4,572,254, Cl. 141-98.000.

Magami, Masato: *See*—
Satake, Toshimi; Minami, Toshiaki; Fujimura, Fumio; Oda, Satoshi; and Magami, Masato, 4,573,062, Cl. 346-209.000.

Mahar, Larry J.; and Douglas, Bruce J., to Earth Technology Corporation, The. Portable seabed penetration system. 4,572,304, Cl. 175-5.000.

Maharaj, Kenrick B.: *See*—
Palfery, Kenneth J.; and Maharaj, Kenrick B., 4,571,814, Cl. 29-568.000.

Maier, Josef. Form for pouring of concrete or the like. 4,572,475, Cl. 249-194.000.

Maier, Wilfried: *See*—
Traumumiller, Gottfried; Maier, Wilfried; Schoffmann, Franz; and Wrulich, Herwig, 4,572,583, Cl. 299-81.000.

Makabe, Hachiro; and Kongoh, Takeshi, to Janome Sewing Machine Industry Co., Ltd. Electronic sewing machine. 4,572,095, Cl. 112-456.000.

Makino, Yuzi: *See*—
Hasegawa, Shumpei; Mishima, Yoshibumi; Kishi, Noriyuki; and Makino, Yuzi, 4,572,141, Cl. 123-339.000.

Makishima, Yoshihiro, to NSK-Warner K.K. Automatic locking type take-up apparatus. 4,572,456, Cl. 242-107.40D.

Malcosky, Norman D., to Columbia Gas System Service Corp. Apparatus and method for detecting gas bubbles in water, and apparatus for handling an oceanographic device. 4,571,984, Cl. 73-19.000.

Malen, Donald E., to General Motors Corporation. Vehicle body floor pan assembly. 4,572,571, Cl. 296-197.000.

Mallevialle, Joel: *See*—
Brodard, Eric; Duguet, Jean-Pierre; Mallevialle, Joel; and Roustan, Michel, 4,572,821, Cl. 422-186.120.

Mallinckrodt, Inc.: *See*—
Selfridge, Glenn D.; and Tipton, Russell C., 4,572,427, Cl. 236-3.000.

Maltby, Frederick L.; and Kramer, L. Jonathan, to Drexelbrook Engineering Company. Fail-safe instrument system. 4,573,040, Cl. 340-511.000.

Mankey, Harry S.: *See*—
Oswald, Norman D.; and Mankey, Harry S., 4,572,311, Cl. 180-6.480.

Mann, Brian M.; and Sholder, Jason A. DDI Programmable cardiac tissue stimulator. 4,572,193, Cl. 128-419.0PG.

Mannella, Henry E.: *See*—
Buchalter, Neal S.; Mannella, Henry E.; and Burkett, Robert A., 4,572,656, Cl. 355-24.000.

Manners, Vincent J. X-Ray diffraction camera. 4,573,182, Cl. 378-075.000.

Mannesmann AG: *See*—
Michel, Rolf; and Fromman, Klaus, 4,572,099, Cl. 118-68.000.

Mantarro, Joseph; Liu, Keh-Chang; and Dempsey, Barry J., to Monsanto Company. Elongated bendable drainage mat. 4,572,700, Cl. 404-35.000.

Marathon Manufacturing Company: *See*—
Stein, Carl; and Lewis, Harold M., 4,572,267, Cl. 160-176.00R.

March, Adrian A. C., to Adrian March Research Ltd. Position sensor with moire interpolation. 4,572,952, Cl. 250-237.00G.

Marchetti, Augusto. Taping machine with easily removable and reattachable vertical components and with doubling possibility. 4,572,760, Cl. 156-468.000.

Marcus, Paul. Container with attachable spout. 4,572,386, Cl. 215-228.000.

Marechal, Roger, to Rocamat. Machine for extracting, rough shaping and squaring blocks of stones, marbles and granites, particularly in quarries. 4,572,303, Cl. 173-39.000.

Marino, Joseph A. Ride-on convertible robot. 4,572,530, Cl. 280-1.185.

Marker International: *See*—
Knabel, Walter; and Klubitschko, Gerd, 4,572,542, Cl. 280-634.000.

Marketing Displays, Inc.: *See*—
Seely, James R., 4,572,473, Cl. 248-624.000.

Markussen, Erik K.: *See*—
Amotz, Shmuel; Rugh, Susanne; Markussen, Erik K.; and Thomsen, Kurt, 4,572,897, Cl. 435-177.000.

Marquest Medical Products, Inc.: *See*—
McKinnon, Robert J., 4,572,210, Cl. 128-765.000.

Martinray Industries Ltd.: *See*—
Labelle, H. M. Robert, 4,571,889, Cl. 49-482.000.

Maruyama Mfg. Co., Ltd.: *See*—
Shimizu, Yoichi, 4,572,242, Cl. 139-91.000.

Maryanoff, Bruce E.: *See*—
Carson, John R.; and Maryanoff, Bruce E., 4,572,911, Cl. 514-291.000.

Masaki, Kazumi, to Hayashibara, Ken. Device for regulating ac current circuit. 4,572,992, Cl. 315-310.000.

Masaki, Yuichi; and Ogura, Makoto, to Canon Kabushiki Kaisha. Electrooptical device having thinner liquid crystal layer in display portions. 4,572,617, Cl. 350-339.00R.

Masayuki, Kiyosawa; Nobuaki, Inoue; and Eiichi, Sonoda, to Ube Industries, Ltd. Cyclone. 4,572,727, Cl. 55-414.000.

Maschinenfabrik Alfred Schmermund GmbH & Co.: *See*—
Zeitel, Joachim, 4,571,918, Cl. 53-149.000.

Mase, Yasushi: *See*—
Nakajima, Masataka; Mase, Yasushi; and Tamura, Yoshiharu, 4,572,135, Cl. 123-440.000.

Mason, William. Apparatus for processing sugar cane. 4,572,741, Cl. 127-2.000.

Massachusetts Institute of Technology: *See*—
Flemings, Merton C.; and Lux, Andrew L., 4,572,818, Cl. 420-590.000.
Wrighton, Mark S.; Buchanan, Robert M.; and Calabrese, Gary S., 4,572,774, Cl. 204-238.000.

Mast, Gary C.: *See*—
Brauer, Paul R.; Barnickel, Thomas J.; and Mast, Gary C., 4,572,009, Cl. 73-864.910.

Masters, Adrian G., to United Biscuits (UK) Limited. Heating food articles. 4,572,061, Cl. 99-331.000.

Masuda, Akira: *See*—
Nakatsuka, Hirotaka; Miyaki, Masahiko; and Masuda, Akira, 4,572,137, Cl. 123-450.000.

Masumoto, Hakaru; and Murakami, Yuetsu, to Foundation: The Research Institute of Electric and Magnetic Alloys, The. Magnetic alloy for magnetic recording-reproducing head. 4,572,750, Cl. 148-31.550.

Matano, Taiji; Ueno, Haruyuki; and Fukuda, Kazushige, to Kurosaki Refractories Co., Ltd. Method for producing ceramic sintered body of a Si_3N_4-SiC system. 4,572,902, Cl. 501-97.000.

Mathis, Paul; and Zimmer, Max, to Mathis System-Technik GmbH. Apparatus for mixing batches of flowable solid materials. 4,572,674, Cl. 366-192.000.

Mathis System-Technik GmbH: *See*—
Mathis, Paul; and Zimmer, Max, 4,572,674, Cl. 366-192.000.

Mathison, Allen D.: *See*—
Larson, Richard E.; Nelson, Dale K.; and Mathison, Allen D., 4,572,228, Cl. 137-15.000.

Matkovich, Vlado I.: *See*—
Rosenberg, David J.; and Matkovich, Vlado I., 4,572,724, Cl. 55-159.000.

Matsuda, Terumi: *See*—
Teraoka, Masanori; Matsuda, Terumi; and Yamazaki, Hisashi, 4,572,955, Cl. 250-483.100.

Matsuda, Yasuhiko, to Yoshida Kogyo K.K. Device for guiding concealed slide fastener stringers to a sewing machine. 4,572,088, Cl. 112-104.000.

Matsui, Kazuyuki: *See*—
Suga, Masataka; Yamada, Makoto; Takahashi, Kazuhide; Iwasaki, Nobuhiro; Matsui, Kazuyuki; Izawa, Toru; Watanabe, Itaru; and Tagawa, Hisatoshi, 4,572,748, Cl. 148-12.00F.

Matsukawa, Naohiro, to Tokyo Shibaura Denki Kabushiki Kaisha. Semiconductor memory device having tunnel diodes. 4,573,143, Cl. 365-175.000.

Matsumoto, Hideo: *See*—
Tanaka, Yuji; and Matsumoto, Hideo, 4,572,049, Cl. 84-313.000.

Matsumoto, Kazutaka: *See*—
Ikeya, Hirotoshi; Suzuki, Shuichi; Oguni, Takayuki; Matsumoto, Kazutaka; and Hatanaka, Akiko, 4,572,853, Cl. 428-76.000.

Matsumoto, Kuniyoshi, to Sanshin Kogyo Kabushiki Kaisha. Separate lubricating system for marine propulsion device. 4,572,120, Cl. 123-196.00S.

Matsumoto, Satoshi: *See*—
Fukuoka, Masayuki; and Matsumoto, Satoshi, 4,571,813, Cl. 29-568.000.

Matsumoto, Takayuki; and Iwai, Tadahiko, to Ishikawajima-Harima Jukogyo Kabushiki Kaisha. Device for disassembling and reassembling a main steam isolation valve of a nuclear reactor. 4,571,820, Cl. 29-723.000.

Matsumoto, Yoshikane; Kobayashi, Tsuneki; Kurosawa, Makoto; and Seino, Minoru, to Hitachi Koki Co., Ltd. Dot printer. 4,572,685, Cl. 400-320.000.

Matsumura, Isao: *See*—
Madate, Haruhisa; Matsumura, Isao; and Sekiguchi, Kyoji, 4,572,627, Cl. 351-206.000.

Matsuno, Kiyotaka: *See*—
Tsukamoto, Keisuke; Nagase, Masaomi; and Matsuno, Kiyotaka, 4,572,130, Cl. 123-357.000.

Matsuo, Michiko, Takeshi Matsuo, Tazuko Mastsuo, heirs: *See*—
Matsuo, Taisuke, deceased; Ochiai, Michihiko; and Kishimoto, Shoji, 4,572,801, Cl. 260-245.400.

Matsuo, Taisuke, deceased (by Matsuo, Michiko, Takeshi Matsuo, Tazuko Mastsuo, heirs); Ochiai, Michihiko; and Kishimoto, Shoji, to Takeda Chemical Industries, Ltd. 4-Carbamoyloxymethyl-1-sulfo-2-oxoazetidine derivatives and their production. 4,572,801, Cl. 260-245.400.

Matsushima, Yuichi: *See*—
Sakai, Kazuo; Matsushima, Yuichi; Akiba, Shigeyuki; and Utaka, Katsuyuki, 4,573,161, Cl. 372-45.000.

Matsushita Electric Industrial Co., Ltd.: *See*—
Nariai, Shigeru; Himeno, Yasunori; and Shimokawa, Naoki, 4,571,950, Cl. 62-89.000.

Mattern, Heinz E.: *See*—
Wiesner, Hagen-Heinz; and Mattern, Heinz E., 4,572,588, Cl. 305-58.0PC.

Mattler, Martin. Clamping/cutting apparatus. 4,572,181, Cl. 128-305.000.

Mattsson, Soren: *See*—
Gronberg, Thomas; Almen, Torsten; Golman, Klaes; Mattsson, Soren; and Sjoberg, Staffan, 4,573,181, Cl. 378-45.000.

Maucher, Paul, to LUK Lamellen und Kupplungsbau GmbH. Self-adjusting release system for friction clutches. 4,572,341, Cl. 192-13.00R.

Mauchlen, Donald B., to Canada, Her Majesty the Queen in right of, as represented by the Minister of National Defence. Mechanical thruster. 4,572,011, Cl. 74-3.500.

Mauldin, Donald M.; and Jones, Richard E., III, to Driver, Kenneth D.; and Stills, Melvin L. Removable lower leg brace. 4,572,169, Cl. 128-80.00H.

May, James P.; and Eppler, Arthur R., to Instrument Specialties Co., Inc. Electromagnetic shielding device. 4,572,921, Cl. 174-35.0GC.

May, Jim. Depth-of-cut gauge. 4,571,840, Cl. 33-185.00R.

Mayer, Edward F.: *See*—
Morrison, Elden R.; Mayer, Edward F.; Pfeuffer, Donald F.; and van Blerk, Victor B., 4,572,655, Cl. 355-15.000.

Mayer, Geoffrey R.: *See*—
Bruno, Robert H.; Johns, Robert G.; Kipperman, Stuart; Mayer, Geoffrey R.; Protzmann, Donald E.; and Uhl, Robert F., 4,572,365, Cl. 206-306.000.

Mayer, Jurgen: *See*—
Kessler, Peter; and Mayer, Jurgen, 4,571,770, Cl. 15-250.420.

Mayer, Roland: *See*—
Hanschke, Christoph; and Mayer, Roland, 4,572,996, Cl. 318-341.000.

Mayer, Rolf: *See*—
Grunwald, Werner; Imhof, Ernst; Komaroff, Iwan; Mayer, Rolf; and Schmid, Gunther, 4,572,146, Cl. 123-549.000.

Mayer, Wolfram: *See*—
Wegner, Christian; Schneider, Gottfried; and Mayer, Wolfram, 4,572,171, Cl. 128-90.000.

Mazda Motor Corporation: *See*—
Kanazawa, Hirotaka; Teruhiko, Takatani; Shigeki, Furutani; Chikuma, Isamu; Shimada, Satoru; and Eda, Hiroshi, 4,572,316, Cl. 180-143.000.
Sakurai, Shigeru, 4,571,938, Cl. 60-303.000.
Yokooku, Katsuhiko; Seo, Nobuhide; Oda, Hiroyuki; and Yatomi, Satoshi, 4,572,031, Cl. 74-866.000.

Maze, Kenneth W., to RCA Corporation. Progressive scan television receiver with adaptive memory addressing. 4,573,080, Cl. 358-140.000.

Mazur, Chester C., to United States Steel Corporation. Digital method for the measurement and control of liquid level in a continuous casting mold. 4,573,128, Cl. 364-509.000.

McBride, Curtis J. Grass ski. 4,572,528, Cl. 280-11.1ET.

McConachie, Malcolm A.; and Rance, John, to Racal-Milgo Limited. Two channel looped communication system having rerouting and folded loop capabilities. 4,573,044, Cl. 340-825.050.

McCord, James W. Vapor generating and recovery apparatus. 4,572,767, Cl. 202-170.000.

McGean-Rohco, Inc.: *See*—
Muller, Jacobus L., 4,572,792, Cl. 252-171.000.

McGlasson, Albert J.: *See*—
Miller, Daniel R.; and McGlasson, Albert J., 4,572,368, Cl. 206-328.000.

McKinnon, Robert J., to Marquest Medical Products, Inc. Syringe with means for allowing passage of air while preventing the passage of blood to obtain a gas-free blood sample. 4,572,210, Cl. 128-765.000.

McKinzie, William E., III, to Motorola, Inc. Drift-equalized, multi-frequency oscillator. 4,573,025, Cl. 331-117.00D.

McLaughlin, Kevin: *See*—
Birritella, Mark S.; and McLaughlin, Kevin, 4,571,817, Cl. 29-576.00B.

McLevige, William V.; Yuan, Han-Tzong; Duncan, Walter M.; and Doerbeck, Friedrich H., to Texas Instruments Incorporated. GaAs/-GaAlAs Heterojunction bipolar integrated circuit devices. 4,573,064, Cl. 357-16.000.

McMahon, Michael F., Jr.; and Lavenz, James M., to Rockwell International Corporation. Sync detect circuit. 4,573,171, Cl. 375-114.000.

McMurtry, David R., to Rolls-Royce Ltd.; and Renishaw plc. Method and apparatus for use in co-ordinate measuring machines. 4,571,847, Cl. 33-503.000.

McNeal, Joseph R.: *See*—
Carroll, John E.; and McNeal, Joseph R., 4,571,748, Cl. 2-436.000.

McNeilab, Inc.: *See*—
Carson, John R.; and Maryanoff, Bruce E., 4,572,911, Cl. 514-291.000.

McQuade, Robert W.: *See*—
Guarracini, Joseph; Shepherd, Paul E.; and McQuade, Robert W., 4,572,021, Cl. 74-479.000.

Mead Corporation, The: *See*—
West, Kenneth O., 4,572,716, Cl. 410-36.000.

Meade, Robert W.: *See*—
Lounsberry, Brian D.; and Meade, Robert W., 4,573,185, Cl. 378-125.000.

Medlin, Lewis B. Brackets for mounting pairs of electrical outlet boxes. 4,572,391, Cl. 220-3.900.

Medrano, Walter A. Shoe insert. 4,571,853, Cl. 36-43.000.

Medtronic, Inc.: *See*—
Hess, Douglas N., 4,572,605, Cl. 339-177.00R.

Mefford, Joseph P., to Harris Corporation. Digital test probe having memory for logic levels at different test locations. 4,573,007, Cl. 324-133.000.

Meier, Carl H.: *See*—
Ferguson, Gary L.; and Meier, Carl H., 4,573,114, Cl. 364-138.000.

Meierkord, Ralf: *See*—
Josuttis, Horst; Meierkord, Ralf; and Welsch, Hans-Jurgen, 4,572,216, Cl. 131-70.000.

Meiji Seika Kaisha Ltd.: *See*—
Hachiya, Iwao; and Joyama, Norio, 4,572,835, Cl. 426-306.000.

Melvin, Waymon A., Jr.; and York, Theodore H., to Westinghouse Electric Corp. Apparatus and method for sampling multiple carrier signals. 4,573,170, Cl. 375-100.000.

Menhorn, Hermann: *See*—
Nitschke, Christoph; Wehrberger, Helmut; and Menhorn, Hermann, 4,572,929, Cl. 191-29.00R.

Merck Patent Gesellschaft mit beschrankter Haftung: *See*—
Eidenschink, Rudolf; and Weber, Georg, 4,572,794, Cl. 252-299.200.

Merlier, Christian: *See*—
Bodier, Jacques; Cochard, Pierre; Merlier, Christian; and Bouquin, Edouard P., 4,572,632, Cl. 353-71.000.

Merrow Machine Company, The: *See*—
Armstead, George B., Jr., 4,572,092, Cl. 112-256.000.

Messer Griesheim GmbH: *See*—
Bakowsky, Lothar; Beyer, Eckhard; Herziger, Gerd; and Loosen, Peter, 4,573,162, Cl. 372-61.000.

Messerschmitt-Boelkow-Blohm Gesellschaft mit beschraenkter Haftung: *See*—
Koenig, Herbert, 4,573,125, Cl. 364-434.000.

Messier-Hispano-Bugatti: *See*—
Guichard, Jean, 4,572,585, Cl. 303-3.000.

Messineo, Leonard E., to All American Products, Inc. Stand for stationary bicycling. 4,572,502, Cl. 272-73.000.

Metal Box p.l.c.: *See*—
Juty, Andrzej J. J., 4,572,398, Cl. 220-271.000.
Taube, William L.; and Roberts, David A., 4,571,978, Cl. 72-349.000.

Metallgesellschaft Aktiengesellschaft: *See*—
Poetzschke, Manfred; and Sattler, Hans-Peter, 4,572,735, Cl. 75-10.00R.

Metcast Associates, Inc.: *See*—
Groteke, Daniel E.; and Kearney, Avery L., 4,572,486, Cl. 266-229.000.

Mettler, Karl, to Etablissement Supervis. Steering column for a motor vehicle steering mechanism and method of producing the column. 4,572,022, Cl. 74-492.000.

Metz, Arthur J., to Tektronix, Inc. Bipolar analog switch. 4,572,967, Cl. 307-243.000.

Metz, Delano L. Brake adjustment tool. 4,572,040, Cl. 81-463.000.

Metzeler Kautschuk GmbH: *See*—
Hartel, Volker; and Hofmann, Manfred, 4,572,002, Cl. 73-809.000.

Meuwly, Michael S.; Roberts, James A.; Gilbert, James F.; Clavert, Daniel V.; and Green, James B. P., Jr., to Southern Tool Company. Secondary packaging machine. 4,571,916, Cl. 53-48.000.

Meyer, Yves: *See*—
Carre, Jean-Jacques; and Meyer, Yves, 4,571,942, Cl. 60-547.100.

Michael, Ewald: *See*—
Frieling, Focko; and Michael, Ewald, 4,572,974, Cl. 307-475.000.

Michel, Jean-Georges: *See*—
Bui, Ngoc C.; Michel, Jean-Georges; and Monbaron, Jean-Jacques, 4,573,187, Cl. 381-43.000.

Michel, Rolf; and Fromman, Klaus, to Mannesmann AG. Apparatus for selective one and two-sided coating of endless strips of sheet stock. 4,572,099, Cl. 118-68.000.

MIDAC Corporation: *See*—
Auth, Gerry L., 4,572,668, Cl. 356-318.000.

Miffitt, Roger G., to Fletcher-Terry Company. Lubricated glass cutter. 4,571,828, Cl. 30-123.300.

Mifune, Takao: *See*—
Saito, Hiroshi; Okayasu, Hiromasa; Tsuyuki, Shinichi; Kawana, Takeshi; Mifune, Takao; and Yoshizaki, Masanori, 4,571,822, Cl. 29-736.000.

Miki, Nobuaki, to Aisin-Warner Kabushiki Kaisha. Lock-up clutch system for vehicular automatic transmission. 4,572,338, Cl. 192-3.290.

Mikuriya, Hideo. Scale balancing device in universal parallel ruler device. 4,571,846, Cl. 33-438.000.

Miller Brewing Company: *See*—
Vanderbush, Herman H., Jr.; and Yarbrough, Hugh W., 4,572,033, Cl. 81-3.200.

Miller, Daniel R.; and McGlasson, Albert J., to Buckhorn Material Handling Group, Inc. Tote box. 4,572,368, Cl. 206-328.000.

Miller, John R., to Southern Railway Company. Spike straightening apparatus. 4,571,981, Cl. 72-400.000.

Miller, Robert E.; and Vervacke, Steven L., to Appleton Papers Inc. Record member. 4,573,063, Cl. 346-216.000.

Miller, Roger L.: *See*—
Bean, Lloyd F.; and Miller, Roger L., 4,572,647, Cl. 355-3.00R.

Miller, Stephen A.: *See*—
Cressey, John R.; and Miller, Stephen A., 4,573,175, Cl. 377-44.000.

Mills, David, to Rolls-Royce Limited. Method of casting using non-silica based ceramic cores for castings. 4,572,272, Cl. 164-131.000.

Mills, Geoffrey S. Teat cup milking inflation or liner. 4,572,106, Cl. 119-14.470.

Minami, Toshiaki: *See*—
Satake, Toshimi; Minami, Toshiaki; Fujimura, Fumio; Oda, Satoshi; and Magami, Masato, 4,573,062, Cl. 346-209.000.

Mining Services International Corporation: *See*—
Day, John T.; and Udy, Lex L., 4,572,075, Cl. 102-313.000.

Minnebraker, Jeffrey P., to Quadra Wheelchairs, Inc. Wheelchair with swingable foot support assemblies. 4,572,576, Cl. 297-429.000.

Minnesota Mining and Manufacturing Company: *See*—
Gerfast, Sten R., 4,573,096, Cl. 360-133.000.
Kirchhoff, Kenneth J.; and Lightfoot, Clinton W., 4,572,691, Cl. 401-214.000.
Morioka, Eddie T., 4,571,789, Cl. 24-625.000.
Pastor, Sheldon L.; and Louks, John W., 4,573,097, Cl. 360-135.000.

Minolta Camera Kabushiki Kaisha: *See*—
Ishihara, Kazuo; and Kobayashi, Haruo, 4,572,641, Cl. 354-121.000.
Ito, Masazumi; Irie, Yutaka; Ikenoue, Yoshikazu; and Nakamura, Minoru, 4,572,653, Cl. 355-14.00R.
Nakai, Masaaki; Ishimura, Toshihiko; and Honda, Yasuhisa, 4,572,638, Cl. 354-286.000.
Yuge, Shizuo; Oka, Tateki; Sakakibara, Susumu; and Toyoshi, Naoki, 4,572,102, Cl. 118-689.000.

Minter, Mearl, to Rolscreen Company. Room addition construction. 4,571,899, Cl. 52-60.000.

Mirabile, Paul J. Beverage tube cleaner. 4,572,230, Cl. 137-240.000.

Mirow, Fred. Switching amplifier system. 4,573,018, Cl. 330-10.000.

Mirowski, Mieczyslaw; Mower, Morton M.; and Langer, Alois A., to Mirowski, Mieczyslaw. Command atrial cardioverter. 4,572,191, Cl. 128-419.00D.

Mischel, Kenneth J. Chain flail. 4,572,258, Cl. 144-208.00J.

Mishima, Yoshibumi: *See*—
Hasegawa, Shumpei; Mishima, Yoshibumi; Kishi, Noriyuki; and Makino, Yuzi, 4,572,141, Cl. 123-339.000.

Mitani, Susumu: *See*—
Arita, Kishio; Mitani, Susumu; Sakai, Hideo; Sudo, Yoshikazu; Koide, Yoshitaka; Sato, Haruzi; Habuka, Yoshio; Kozakai, Takashi; and Tanaka, Hiroji, 4,571,999, Cl. 73-598.000.

Mitchell, Forrest R., to Shell Oil Company. Finding distance to blow-out using wellbore acoustic measurements. 4,572,322, Cl. 181-105.000.

Mitchell, John; and Ament, Charles E., to Ament Enterprises, Inc. Magnetic fuel line device. 4,572,145, Cl. 123-538.000.

Mitchell, Stephen W., to National Research Development Corp. Balancing system. 4,572,025, Cl. 74-604.000.

Mitsubishi Denki Kabushiki Kaisha: *See*—
Arita, Kishio; Mitani, Susumu; Sakai, Hideo; Sudo, Yoshikazu; Koide, Yoshitaka; Sato, Haruzi; Habuka, Yoshio; Kozakai, Takashi; and Tanaka, Hiroji, 4,571,999, Cl. 73-598.000.
Fujii, Masao; Nakao, Kazushige; and Tetsuno, Haruo, 4,572,286, Cl. 165-104.290.
Shinma, Mitsuru; Kobayashi, Toyohiro; Mori, Masahito; Tsuboi, Shunji; and Sugita, Masaru, 4,573,059, Cl. 346-76.0PH.
Shuto, Yukichi; and Miyagawa, Tamotsu, 4,573,193, Cl. 382-2.000.

Mitsubishi Jukogyo Kabushiki Kaisha: *See*—
Hino, Masao; Honda, Mitsuyasu; and Seto, Toru, 4,572,903, Cl. 502-55.000.

Mitsui Kinzoku Kogyo K.K.: *See*—
Nakamura, Shuji; Koike, Masami; and Yasuki, Shigehiro, 4,572,572, Cl. 296-223.000.

Mitze, Rudolf; and Simeth, Claus, to M.A.N.-Roland Druckmaschinen Aktiengesellschaft. Sheet guide arrangement in sheet-fed machines. 4,572,073, Cl. 101-350.000.

Miura, Kiyoshi, to Hitachi, Ltd. Method of manufacturing fluorescent screens. 4,572,880, Cl. 430-25.000.

Miura, Yukio, to Tokico Ltd. Control system for controlling a supply of fluid to an integral quantity. 4,572,405, Cl. 222-14.000.

Miyagawa, Tamotsu: *See*—
Shuto, Yukichi; and Miyagawa, Tamotsu, 4,573,193, Cl. 382-2.000.

Miyake, Junichi: *See*—
Sakurai, Yoshimi; and Miyake, Junichi, 4,572,030, Cl. 74-866.000.

Miyaki, Masahiko: *See*—
Nakatsuka, Hirotaka; Miyaki, Masahiko; and Masuda, Akira, 4,572,137, Cl. 123-450.000.

Miyaki, Takeo: *See*—
Konishi, Masataka; Sugawara, Koko; Miyaki, Takeo; and Kawaguchi, Hiroshi, 4,572,895, Cl. 435-75.000.

Miyamoto, Yasuhiro: *See*—
Oguri, Itsuro; and Miyamoto, Yasuhiro, 4,572,751, Cl. 148-35.000.

Miyata, Mitsuto: *See*—
Nozawa, Ryoichiro; Kawamura, Hideaki; and Miyata, Mitsuto, 4,572,998, Cl. 318-572.000.

Miyauchi, Katsuki: *See*—
Kanehori, Keiichi; Miyauchi, Katsuki; and Kudo, Tetsuichi, 4,572,873, Cl. 428-432.000.

Miyazawa, Yoshinori; and Mizuno, Shigeki, to Epson Corporation. Wire dot print head. 4,572,681, Cl. 400-124.000.

Mizuno, Shigeki: *See*—
Miyazawa, Yoshinori; and Mizuno, Shigeki, 4,572,681, Cl. 400-124.000.

MKS Instruments, Inc.: *See*—
Ewing, James H., 4,571,801, Cl. 29-157.00R.

Mobil Oil Corporation: *See*—
Owen, Hartley; and Schatz, Klaus W., 4,572,780, Cl. 208-161.000.

Mobs, Heinrich: *See*—
Dreschel, Jurgen; Mobs, Heinrich; and Hog, Peter, 4,572,497, Cl. 270-58.000.

Mochizuki, Kiyofumi; and Namihira, Yoshinori, to Kokusai Denshin Denwa Co., Ltd. Optical de-polarizer. 4,572,608, Cl. 350-96.150.

Moehren, Hans-Heiner. Anchor lock fastening assembly. 4,572,432, Cl. 238-327.00R.

Moke, Harold C. Cogeneration and sludge drying system. 4,571,949, Cl. 60-655.000.

Molins Limited: *See*—
Dyett, Derek H.; Hoath, Grantley R.; and Horsley, John K., 4,572,352, Cl. 198-457.000.

Moller, Jens Gert K., to Superros Dammann-Luxol A/S, Frydenlundsvej. Apparatus for applying to a road, run-way or equivalent a point-formed or dotted paint or marking, especially a traffic indication line. 4,572,703, Cl. 404-94.000.

Moltner, Hermann; and Staat, Karl-Hans, to Kocks Technik GmbH & Co. Rolling mill plant for the manufacture of seamless tubes. 4,571,970, Cl. 72-68.000.

Monbaron, Jean-Jacques: *See*—
Bui, Ngoc C.; Michel, Jean-Georges; and Monbaron, Jean-Jacques, 4,573,187, Cl. 381-43.000.

Monroe Systems for Business, Inc.: *See*—
King, Christopher C., 4,572,661, Cl. 355-3.0DD.

Monsanto Company: *See*—
Mantarro, Joseph; Liu, Keh-Chang; and Dempsey, Barry J., 4,572,700, Cl. 404-35.000.

Montgomery, Keneith R. Fishing lure. 4,571,877, Cl. 43-42.110.

Mooradian, Gregory C., to United States of America, Navy. Satellite mounted system for transferring information using modulated sunlight. 4,573,214, Cl. 455-605.000.

Moore Business Forms, Inc.: *See*—
Casper, Mark S.; and Thomson, Robert I., 4,572,496, Cl. 270-52.500.

Moore, Franklin, Jr. Salad bar for supermarkets and restaurants. 4,572,598, Cl. 312-284.000.

Moore, George R., to Shell Oil Company. Two stage process for HCN removal from gaseous streams. 4,572,826, Cl. 423-236.000.

Moore, Richard H.; Strauss, H. William; and Alpert, Nathaniel M., to General Hospital Corporation, The. Body hugging instrumentation vest having radioactive emission detection for ejection fraction. 4,572,197, Cl. 128-644.000.

Morgan Flotation Systems: *See*—
Rhoton, Albert L.; and Ribblett, Gregory A., 4,571,762, Cl. 5-451.000.

Mori, Ichiro: *See*—
Tojo, Toru; Mori, Ichiro; Shinozaki, Toshiaki; Sugihara, Kazuyoshi; Tabata, Mitsuo; and Itoh, Chikara, 4,572,956, Cl. 250-492.200.
Mori, Kei. Solar ray collector device. 4,572,161, Cl. 126-440.000.
Mori, Kei. Crane. 4,572,383, Cl. 212-264.000.
Mori, Kei. Method and apparatus for illuminating a spot inside of a tunnel of a highway. 4,572,613, Cl. 350-265.000.
Mori, Kenzo; and Yasuda, Hyo, to Taiyo Musen Co., Ltd. Automatic direction finder. 4,573,053, Cl. 343-441.000.
Mori, Masahito: *See*—
Shinma, Mitsuru; Kobayashi, Toyohiro; Mori, Masahito; Tsuboi, Shunji; and Sugita, Masaru, 4,573,059, Cl. 346-76.0PH.
Morikawa, Toyohiko, to Nippon Cable System Inc. Weighted cable cap. 4,572,696, Cl. 403-265.000.
Morioka, Eddie T., to Minnesota Mining and Manufacturing Company. Snap fastener for belt driven cartridge. 4,571,789, Cl. 24-625.000.
Morioka, Masakazu: *See*—
Nakamura, Syuichi; and Morioka, Masakazu, 4,573,016, Cl. 324-326.000.
Morioka, Yuji, to Sanyo Electric Co., Ltd. Lead-acid cell and method of producing same. 4,572,879, Cl. 429-94.000.
Morita Iron Works Company, Ltd.: *See*—
Morita, Motoo, 4,571,973, Cl. 72-137.000.
Morita, Isamu, to Honda Giken Kogyo Kabushiki Kaisha. Engine-mounting structure. 4,572,321, Cl. 180-297.000.
Morita, Motoo, to Morita Iron Works Company, Ltd. Method and apparatus for forming a pig tail end on a coil spring. 4,571,973, Cl. 72-137.000.
Morito, Hiroshi, to Nippon Electric Co., Ltd. Counter employing feedback shift register controlling hysteresis circuit. 4,573,178, Cl. 377-97.000.
Morris, Earl L.; and Hafner, V. Walter, to Acorn Engineering Company. Vandal-resistant security view port. 4,571,901, Cl. 52-106.000.
Morris, Robert L., to Ford Motor Company. Interactive spark and throttle idle speed control. 4,572,127, Cl. 123-339.000.
Morris, William L., to Handleman Company. Theft resistant cassette holder. 4,572,369, Cl. 206-387.000.
Morrison, Elden R.; Mayer, Edward F.; Pfeuffer, Donald F.; and van Blerk, Victor B., to Ricoh Systems, Inc. Electrophotographic copying apparatus and method of use including electrostatic toner recycling procedure. 4,572,655, Cl. 355-15.000.
Morrison, Joseph A. Bookpin. 4,572,546, Cl. 281-42.000.
Morrison, Ronald A.: *See*—
Ganesan, Apparajan; and Morrison, Ronald A., 4,573,099, Cl. 361-56.000.
Morse, David L.: *See*—
Bellman, Robert H.; Borrelli, Nicholas F.; Morse, David L.; and Sachenik, Paul A., 4,572,611, Cl. 350-167.000.
Morton Thiokol, Inc.: *See*—
Bell, Frank H., 4,572,078, Cl. 102-464.000.
Mostek Corporation: *See*—
Graham, Andrew C.; Proebsting, Robert J.; and Segers, Dennis L., 4,573,146, Cl. 365-200.000.
Mostyn Chemicals Ltd.: *See*—
Howard, Frank A., 4,572,733, Cl. 71-64.080.
Motorola, Inc.: *See*—
Allen, Gordon H.; and Ray, Kenneth I., 4,572,970, Cl. 307-254.000.
Birritella, Mark S.; and McLaughlin, Kevin, 4,571,817, Cl. 29-576.00B.
Boney, Joel F., 4,573,117, Cl. 364-200.000.
Countryman, Roger S., Jr., 4,573,144, Cl. 365-185.000.
Foss, Robert M.; and Severson, Gerald R., 4,572,846, Cl. 427-237.000.
Heck, Joseph P., 4,573,210, Cl. 455-166.000.
Levine, Stephen N., 4,573,017, Cl. 328-155.000.
McKinzie, William E., III, 4,573,025, Cl. 331-117.00D.
Petty, Thomas D., 4,572,968, Cl. 307-252.00G.
Smith, Paul F.; Schorman, Eric; Burke, Tim; and Lynk, Chuck, 4,573,207, Cl. 455-54.000.
Whatley, Roger A., 4,573,020, Cl. 330-258.000.
Moulin, Blaise, to Caracteres S.A. Needle-carrying head for a printing machine. 4,572,070, Cl. 101-93.050.
Mowbray, Dorian F., to Lucas Industries public limited company. Fuel injection pumping apparatus. 4,572,138, Cl. 123-450.000.
Mower, Morton M.: *See*—
Mirowski, Mieczyslaw; Mower, Morton M.; and Langer, Alois A., 4,572,191, Cl. 128-419.00D.
MTU - Motoren-und Turbinen-Munchen GmbH: *See*—
Albers, Martin, 4,571,937, Cl. 60-39.750.
MTU Motoren- und Turbinen-Union Friedrichshafen GmbH: *See*—
Deutschmann, Herbert; Schmidt, Erhard; and Wolters, Gerd-Michael, 4,572,148, Cl. 123-559.000.
Mueller, Gerhard: *See*—
Engelfried, Werner; and Mueller, Gerhard, 4,571,957, Cl. 66-115.000.
Mueller, Thomas D.; and Gessner, James D., to Mueller, Thomas D.; and Crown Technology Corporation. Variable proportioner. 4,572,229, Cl. 137-99.000.
Muise, Herbert D.; and Hunter, R. Scott, to Weyerhaeuser Company. Blank for a pair of nested containers. 4,572,424, Cl. 229-39.00R.
Mukai, Teruo: *See*—
Sasaki, Noboru; Mukai, Teruo; and Iwata, Yasuji, 4,571,759, Cl. 5-90.000.
Muller, Dieter J.; and Spielbrink, Heinrich, to Huels Aktiengesellschaft. Method for pickling metallic surfaces. 4,572,743, Cl. 134-3.000.
Muller, Jacobus L., to McGean-Rohco, Inc. Stripper composition for a paint having a polysulfide basecoat. 4,572,792, Cl. 252-171.000.
Muller, Reinhard: *See*—
Cirkel, Hans-Jurgen; Bette, Willi; and Muller, Reinhard, 4,573,160, Cl. 372-38.000.
Mullins, Michael J., to Dow Chemical Company, The. Preparation of unsaturated isocyanates. 4,572,804, Cl. 260-453.00P.
Mullner, Paul; and Enkner, Bernhard, to Voest-Alpine Aktiengesellschaft. Method and arrangement for recovering the sensible heat of slag. 4,572,281, Cl. 165-1.000.
Mundt, Randall S.: *See*—
Rogers, Steven H.; Mundt, Randall S.; and Kaya, Denise A., 4,571,819, Cl. 29-576.00W.
Murai, Kazuo; and Hasegawa, Yutaka, to Ricoh Company, Ltd. Image density control method for electrophotography. 4,572,654, Cl. 355-14.00D.
Murakami, Yuetsu: *See*—
Masumoto, Hakaru; and Murakami, Yuetsu, 4,572,750, Cl. 148-31.550.
Murata Manufacturing Co., Ltd.: *See*—
Nakamura, Takeshi, 4,571,794, Cl. 29-25.350.
Takeno, Seiichi, 4,573,101, Cl. 361-321.000.
Murphy, John F.: *See*—
Barton, William M., Jr.; Murphy, John F.; Offerman, Karl B.; and Fisher, Richard G., 4,573,091, Cl. 360-93.000.
Murphy, Robert J., Jr., to NL Industries, Inc. Apparatus and method for measuring viscosity. 4,571,988, Cl. 73-60.000.
Murray, Douglas G.: *See*—
Sparkes, Brian G.; and Murray, Douglas G., 4,572,906, Cl. 514-21.000.
Musashi Seimitsu Kogyo Kabushiki Kaisha: *See*—
Nemoto, Akira, 4,572,693, Cl. 403-134.000.
Musikas, Claude: *See*—
Hubert, Herve ; and Musikas, Claude, 4,572,802, Cl. 534-12.000.
Myung Ho, Cho. Pivotal skipping rope handles having spring resistance. 4,572,503, Cl. 272-75.000.
NACAM: *See*—
Haldric, Bernard, 4,572,697, Cl. 403-344.000.
Nadzan, Alex M.; Pernet, Andre G.; and Hanessian, Stephen, to Abbott Laboratories. High caloric product for I.V. administration. 4,572,907, Cl. 514-25.000.
Nagase, Masaomi: *See*—
Tsukamoto, Keisuke; Nagase, Masaomi; and Matsuno, Kiyotaka, 4,572,130, Cl. 123-357.000.
Nagashima, Akira, to Kioritz Corporation. Sawdust discharge port. 4,571,833, Cl. 30-381.000.
Naimer, Hubert L.; and Alsch, Gottfried. Switch device. 4,573,029, Cl. 335-122.000.
Nakai, Masaaki; Ishimura, Toshihiko; and Honda, Yasuhisa, to Minolta Camera Kabushiki Kaisha. Intermediate accessory for a camera. 4,572,638, Cl. 354-286.000.
Nakajima, Hiroshi: *See*—
Imahori, Kazutomo; Nakajima, Hiroshi; Iwasaki, Tatsuo; Tomioka, Isao; and Yamamoto, Keiichi, 4,572,894, Cl. 435-68.000.
Nakajima, Masataka; Mase, Yasushi; and Tamura, Yoshiharu, to Nissan Motor Company, Limited. Air-to-fuel ratio control system for an engine. 4,572,135, Cl. 123-440.000.
Nakamura, Hiroshi; Fukuda, Eisuke; and Sasaki, Susumu, to Fujitsu Limited. Data transmitting-receiving system for suppressing data error. 4,573,153, Cl. 371-22.000.
Nakamura, Issei; and Itozawa, Kenji, to Konishiroku Photo Industry Co., Ltd. Magnetic recording medium. 4,572,866, Cl. 428-328.000.
Nakamura, Issei; and Itozawa, Kenji, to Konishiroku Photo Industry Co., Ltd. Magnetic recording medium. 4,572,867, Cl. 428-328.000.
Nakamura, Masaki; Abe, Takao; Koshizuka, Kunihiro; Kitamura, Shigehiro; Ishii, Fumio; and Hotta, Yuji, to Konishiroku Photo Industry Co., Ltd. Thermal transfer recording medium. 4,572,860, Cl. 428-216.000.
Nakamura, Masaru: *See*—
Uemura, Michio; Sato, Yutaka; Nakamura, Masaru; and Iida, Toyoshi, 4,572,789, Cl. 252-8.50A.
Nakamura, Minoru: *See*—
Ito, Masazumi; Irie, Yutaka; Ikenoue, Yoshikazu; and Nakamura, Minoru, 4,572,653, Cl. 355-14.00R.
Nakamura, Shuji; Koike, Masami; and Yasuki, Shigehiro, to Mitsui Kinzoku Kogyo K.K.; and Honda Giken Kogyo K.K. Locking device of hood for ventilator window in automobile. 4,572,572, Cl. 296-223.000.
Nakamura, Syuichi; and Morioka, Masakazu, to Osaka Gas Company Limited. Method and arrangement for enabling the detection of the location of a horizontally arranged gas conveying passage positioned underground. 4,573,016, Cl. 324-326.000.
Nakamura, Takeshi, to Murata Manufacturing Co., Ltd. Method of accommodating electronic component in casing. 4,571,794, Cl. 29-25.350.
Nakamura, Toshiaki: *See*—
Kaieda, Osamu; Hirota, Koichi; Okitaka, Isao; and Nakamura, Toshiaki, 4,572,805, Cl. 260-465.00D.
Nakano, Osamu; Ina, Toshikazu; and Kawai, Hisasi, to Nippon Soken, Inc. Apparatus for controlling a plurality of electrical devices. 4,572,963, Cl. 307-10.00R.
Nakao, Kazushige: *See*—
Fujii, Masao; Nakao, Kazushige; and Tetsuno, Haruo, 4,572,286, Cl. 165-104.290.

Nakao, Masashi: *See*—
Kojima, Shuichi; Nakao, Masashi; Gotoh, Miyuki; Ishido, Takao; and Imamura, Shuichiro, 4,572,244, Cl. 139-103.000.
Nakashima, Waichiro; Sasaki, Hiroshi; and Nishizaki, Katsuhiro, to Honda Giken Kogyo Kabushiki Kaisha. Method of producing a machine part of fiber-reinforced composite material, the fiber-reinforcement body and the machine part. 4,572,271, Cl. 164-97.000.
Nakata, Yukio; and Shiotsu, Osamu, to Hitachi, Ltd. Data communication system with error detection/correction. 4,573,154, Cl. 371-34.000.
Nakatsuka, Hirotaka; Miyaki, Masahiko; and Masuda, Akira, to Nippondenso Co., Ltd. Distributor type fuel injection pump. 4,572,137, Cl. 123-450.000.
Nakaya, Chitose: *See*—
Kondo, Shinichi; Nakaya, Chitose; and Ishikawa, Shizuo, 4,572,201, Cl. 128-660.000.
Nakazawa, Hirotsugu: *See*—
Yoshida, Yoichi; Hashimoto, Akihiko; Suzuki, Tatsuya; Shirai, Hitoshi; Akitake, Hiroshi; and Nakazawa, Hirotsugu, 4,572,645, Cl. 354-435.000.
Namihira, Yoshinori: *See*—
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Naniwa Products Co. Ltd.: *See*—
Katashima, Seiji, 4,572,273, Cl. 164-158.000.
Napier, David. Stove adapter for lantern. 4,572,157, Cl. 126-258.000.
Narasimha, Manthri S. I.: *See*—
Bednar, Gregory M.; Fitzpatrick, Brian E.; Harmon, John C.; and Narasimha, Manthri S. I., 4,573,200, Cl. 382-47.000.
Nardin, Steven A.: *See*—
Bisson, Donald K.; and Nardin, Steven A., 4,573,012, Cl. 324-222.000.
Nariai, Shigeru; Himeno, Yasunori; and Shimokawa, Naoki, to Matsushita Electric Industrial Co., Ltd. Method for controlling air-conditioner. 4,571,950, Cl. 62-89.000.
Narita, Katsuyuki, to Nissan Motor Co., Ltd. Rack and pinion steering gear. 4,572,024, Cl. 74-498.000.
Nash, Dudley O.; and Crowley, James A., to United States of America, Air Force. Length adjustable strut link with low aerodynamic drag. 4,571,936, Cl. 60-39.310.
Nash, Randy D., to AT&T Bell Laboratories. Technique for secure communications on FM radio channels. 4,573,205, Cl. 455-30.000.
National Distillers and Chemical Corporation: *See*—
Tomita, Nobuya, 4,571,969, Cl. 72-56.000.
National Research Development Corporation: *See*—
Douglas, Edward; and Webb, Maurice I., 4,572,378, Cl. 209-640.000.
Mitchell, Stephen W., 4,572,025, Cl. 74-604.000.
Schofield, Charles P.; and Wilkin, Arthur L., 4,572,538, Cl. 280-478.00R.
Naylor, Clifford; and Pocknell, David, to Dow Corning, Ltd. Medical-surgical dressing and a process for the production thereof. 4,572,814, Cl. 264-46.400.
Naylor, Geoffrey, to Rieter Scragg Limited. Package mounting apparatus. 4,572,449, Cl. 242-18.0DD.
Nazet, Rene : *See*—
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NCR Canada Ltd - NCR Canada LTEE: *See*—
Brooks, Ralf M., 4,573,058, Cl. 346-76.0PH.
NCR Corporation: *See*—
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Rogers, Steven H.; Mundt, Randall S.; and Kaya, Denise A., 4,571,819, Cl. 29-576.00W.
NEC Corporation: *See*—
Ozawa, Takashi, 4,573,145, Cl. 365-194.000.
Necoechea, R. Warren, to Fairchild Camera and Instrument Corporation. Tri-state driver circuit for automatic test equipment. 4,572,971, Cl. 307-260.000.
Neder, Gunter; and Schurger, Rainer, to SKF Kugellagerfabriken GmbH. Cage for ball bearing, in particular a plastic cage for a four-point contact bearing. 4,572,678, Cl. 384-533.000.
Negishi, Fumio: *See*—
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Neild, A. Bayne: *See*—
Spargo, John D.; Neild, A. Bayne; and Phillips, Martha M., 4,572,518, Cl. 277-75.000.
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Nelle, Gunther, to Dr. Johannes Heidenhain GmbH. Measuring instrument. 4,573,000, Cl. 318-640.000.
Nelson, Dale K.: *See*—
Larson, Richard E.; Nelson, Dale K.; and Mathison, Allen D., 4,572,228, Cl. 137-15.000.
Nemoto, Akira, to Musashi Seimitsu Kogyo Kabushiki Kaisha. Ball-and-socket joint. 4,572,693, Cl. 403-134.000.
Neuman, Grover H.: *See*—
Gaudet, James L.; Lineman, Harry L.; Chukran, Rudolph E.; Neuman, Grover H.; and Barnes, Johnny G., 4,573,138, Cl. 364-900.000.
Neumann, Bernhard; and Ramisch, Rainer, to Otton Dunkel GmbH Fabrik fur Elektrotechnische Gerate. Process for producing contact-spring bushes and a spring contact bush. 4,572,606, Cl. 339-262.00R.
Neumeyer, Martin J.: *See*—
Golden, Robert C.; and Neumeyer, Martin J., 4,572,575, Cl. 297-195.000.
Neuroth, David H.: *See*—
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Newman, Paul D.: *See*—
Newman, William E., Sr.; and Newman, Paul D., 4,572,217, Cl. 131-175.000.
Newman, William E., Sr.; and Newman, Paul D. Fire-safe cigarette holder system. 4,572,217, Cl. 131-175.000.
Newton, Barry P., to English Electric Valve Company Limited. Apparatus for feeding alternate polarity pulses to a load. 4,573,006, Cl. 323-326.000.
Ngai, Peter Y. Y.: *See*—
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NGK Insulators, Ltd.: *See*—
Oguri, Itsuro; and Miyamoto, Yasuhiro, 4,572,751, Cl. 148-35.000.
Nicholson, Harold J.: *See*—
Hsiung, Du Y.; Davis, Chester A.; and Nicholson, Harold J., 4,572,220, Cl. 132-7.000.
Nickol, Friedrich W.; and Baeger, Holm, to VDO Adolf Schindling AG. Multiplexable metal-insulator-metal liquid crystal cell. 4,572,615, Cl. 350-334.000.
Nicol, Stuart W., to Lucas Industries Public Limited Company. Pilot injection device. 4,572,124, Cl. 123-300.000.
Niedecker, Herbert. Apparatus for closing tubular wrappers with U-shaped closing clips. 4,571,805, Cl. 29-243.560.
Niederprum, Klaus, to Ford Motor Company. Storage and transportation rack. 4,572,382, Cl. 211-150.000.
Nielsen, Jean-Paul: *See*—
Cronk, Richard V.; and Nielsen, Jean-Paul, 4,572,170, Cl. 128-80.00C.
Nielsen Moulding Design Corp.: *See*—
Cole, Mark T.; and Sherman, Charles F., 4,571,866, Cl. 40-152.100.
Nielson, Kimberly H.; and Hudson, Lloyd. Non-sparkable safety sample weight. 4,572,008, Cl. 73-864.510.
Nieman, Gerald R., to ITT Corporation. Electrical connector for transient suppression. 4,572,600, Cl. 339-14.00R.
Nifco Inc.: *See*—
Yuda, Takuo, 4,571,773, Cl. 16-85.000.
Nihon Kogyo Kabushiki Kaisha: *See*—
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Nijhuis, Johan W., to Machinefabriek G.J. Nijhuis B.V. Apparatus for automatically stunning animals to be slaughtered. 4,571,777, Cl. 17-1.00E.
Nikkiso Co., Ltd.: *See*—
Arakawa, Kohei, 4,572,813, Cl. 264-29.200.
Nilsson, Per-Ove, to Telefonaktiebolaget L M Ericsson. Cooling device for electronic components connected to a printed circuit board by a holder. 4,573,103, Cl. 361-386.000.
Nippon Air Brake Co., Ltd.: *See*—
Kojima, Katsumi, 4,572,725, Cl. 55-274.000.
Nippon Cable System Inc.: *See*—
Morikawa, Toyohiko, 4,572,696, Cl. 403-265.000.
Suzuki, Kazuhiro, 4,572,019, Cl. 74-471.0XY.
Nippon Electric Co., Ltd.: *See*—
Morito, Hiroshi, 4,573,178, Cl. 377-97.000.
Nippon Kogaku K.K.: *See*—
Nohda, Masao, 4,572,628, Cl. 351-212.000.
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Nippon Kokan Kabushiki Kaisha: *See*—
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Nippon Notion Kogyo Co., Ltd.: *See*—
Fukuroi, Takeo, 4,571,780, Cl. 24-95.000.
Kanzaka, Yoshihiro; and Ito, Masahiko, 4,571,731, Cl. 24-95.000.
Kasai, Kazumi, 4,571,783, Cl. 24-200.000.
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Nippon Piston Ring Co., Ltd.: *See*—
Shinada, Masatoshi, 4,572,520, Cl. 277-140.000.
Nippon Seiko Kabushiki Kaisha: *See*—
Okoshi, Hideo, 4,572,016, Cl. 74-200.000.
Nippon Shokubai Kagaku Kogyo Co., Ltd.: *See*—
Kaieda, Osamu; Hirota, Koichi; Okitaka, Isao; and Nakamura, Toshiaki, 4,572,805, Cl. 260-465.00D.
Nippon Soken, Inc.: *See*—
Kitagawa, Junji; Akita, Sigeyuki; and Yamanoue, Kouichi, 4,573,041, Cl. 340-538.000.
Nakano, Osamu; Ina, Toshikazu; and Kawai, Hisasi, 4,572,963, Cl. 307-10.00R.
Takeuchi, Yasuhiro; Sakakibara, Yasuyuki; and Watanabe, Kazuhide, 4,572,136, Cl. 123-447.000.
Tsuge, Noboru; Kuwakado, Satosi; Taguchi, Masahiro; and Yasui, Toshio, 4,572,543, Cl. 280-807.000.
Nippon Telegraph and Telephone Public Corporation: *See*—
Arita, Kishio; Mitani, Susumu; Sakai, Hideo; Sudo, Yoshikazu; Koide, Yoshitaka; Sato, Haruzi; Habuka, Yoshio; Kozakai, Takashi; and Tanaka, Hiroji, 4,571,999, Cl. 73-598.000.

Nippondenso Co., Ltd.: *See—*
Abe, Tomoaki; Kinugawa, Masumi; and Suzuki, Atsushi, 4,571,991, Cl. 73-118.000.
Handa, Shizuo, 4,572,144, Cl. 123-501.000.
Kamai, Kenichiro; Omori, Norio; Kinugawa, Masumi; and Takao, Mitsunori, 4,572,122, Cl. 123-206.000.
Nakatsuka, Hirotaka; Miyaki, Masahiko; and Masuda, Akira, 4,572,137, Cl. 123-450.000.
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Tsuge, Noboru; Kuwakado, Satosi; Taguchi, Masahiro; and Yasui, Toshio, 4,572,543, Cl. 280-807.000.
Yoshimi, Tomohisa; and Takeo, Yuji, 4,572,207, Cl. 128-706.000.

Nishi Manufacturing Co., Ltd.: *See—*
Nishi, Naoichi, 4,572,089, Cl. 112-128.000.

Nishi, Naoichi, to Nishi Manufacturing Co., Ltd. Edge trimmer for sewing machine. 4,572,089, Cl. 112-128.000.

Nishimura, Tomio; Kikuchi, Junzo; Sugiura, Ryuzo; and Yoshida, Toshiro, to Tamura Electric Works, Ltd. Key telephone system. 4,572,928, Cl. 179-99.00A.

Nishimura, Toshimitsu: *See—*
Fujii, Noritsugu; and Nishimura, Toshimitsu, 4,571,986, Cl. 73-49.100.

Nishio, Motomitsu, to Canon Kabushiki Kaisha. Method of depicting a solid. 4,571,835, Cl. 33-20.100.

Nishiyama, Yoshiaki: *See—*
Numata, Kunio; and Nishiyama, Yoshiaki, 4,573,112, Cl. 363-19.000.

Nishiyama, Yoshihisa, to Tokyo Electric Co., Ltd. Load cell type weight-measuring device. 4,572,309, Cl. 177-50.000.

Nishizaki, Katsuhiro: *See—*
Nakashima, Waichiro; Sasaki, Hiroshi; and Nishizaki, Katsuhiro, 4,572,271, Cl. 164-97.000.

Nishizawa, Jun-ichi, to Zaidan Hojin Handotai Kenkyu Shinkokai. Method and apparatus for performing epitaxial growth of ZnSe crystal from a melt thereof. 4,572,763, Cl. 156-624.000.

Nissan Motor Co., Ltd.: *See—*
Hayashi, Yoshimasa, 4,572,115, Cl. 123-41.210.
Ishigami, Kazuhiro, 4,572,139, Cl. 123-478.000.
Kita, Toru, 4,572,005, Cl. 73-862.360.
Kojima, Shuichi; Nakao, Masashi; Gotoh, Miyuki; Ishido, Takao; and Imamura, Shuichiro, 4,572,244, Cl. 139-103.000.
Kubota, Hitoshi, 4,571,944, Cl. 60-562.000.
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Narita, Katsuyuki, 4,572,024, Cl. 74-498.000.
Yamaguchi, Noboru; and Ito, Kiichiro, 4,572,466, Cl. 248-73.000.

Nitschke, Christoph; Wehrberger, Helmut; and Menhorn, Hermann, to Siemens Aktiengesellschaft. Assembly for the transmission of electrical energy to vehicles. 4,572,929, Cl. 191-29.00R.

Nitsuko Limited: *See—*
Yoshida, Tadahiro, 4,573,173, Cl. 375-118.000.

Niwa, Katsuhisa: *See—*
Tsuzuki, Yu; Watanabe, Hiroshi; and Niwa, Katsuhisa, 4,572,635, Cl. 354-173.100.

Nixon, Edward T. Animal separator gate. 4,572,109, Cl. 119-155.000.

NL Industries, Inc.: *See—*
Murphy, Robert J., Jr., 4,571,988, Cl. 73-60.000.

Nobuaki, Inoue: *See—*
Masayuki, Kiyosawa; Nobuaki, Inoue; and Eiichi, Sonoda, 4,572,727, Cl. 55-414.000.

Noda, Atunari: *See—*
Shimizu, Fumio; Tachikawa, Tetsuya; Ikei, Nobuhiro; Noda, Atunari; Hashimura, Etsuro; and Imagawa, Kenichi, 4,572,800, Cl. 260-112.50R.

Noda, Hideo, to Shimano Industrial Company Limited. Fishing reel with reversible crank. 4,572,455, Cl. 242-84.10R.

Noe, Raymond J., to General Electric Company. Method of making a ribbon blown glass article. 4,572,730, Cl. 65-67.000.

Nohda, Masao, to Nippon Kogaku K.K. Method of and apparatus for measuring radius. 4,572,628, Cl. 351-212.000.

Nordenstrom, Bjorn E. W.; and Olsson, Mats J., to URSUS Konsult AB. Electrode device. 4,572,214, Cl. 128-785.000.

Nordson Corporation: *See—*
Traylor, John C. A., 4,572,438, Cl. 239-708.000.

North American Philips Corporation: *See—*
Fitzpatrick, Brian J., 4,572,984, Cl. 313-467.000.
Zola, John, 4,572,981, Cl. 310-357.000.

North Carolina State University: *See—*
Lanier, Tyre C.; and Akahane, Takayuki, 4,572,838, Cl. 426-643.000.

Norwood, Dorothy. Electrically illuminated artificial tree. 4,573,102, Cl. 362-123.000.

Nouthuka, Hirofumi; and Ohfuji, Mitsuo, to Hitachi, Ltd.; and Hitachi Automotive Eng. Co., Ltd. Double carburetor. 4,572,134, Cl. 123-438.000.

Nouvas Manufacturing Technology Company: *See—*
Rochat, Daniel F.; Ogawa, Chuck C.; and Bui, Uyen D., 4,573,011, Cl. 324-158.00F.

Novo Industri A/S: *See—*
Amotz, Shmuel; Rugh, Susanne; Markussen, Erik K.; and Thomsen, Kurt, 4,572,897, Cl. 435-177.000.

Nozawa, Ryoichiro; Kawamura, Hideaki; and Miyata, Mitsuto, to Fanuc Limited. Tool radius compensation system. 4,572,998, Cl. 318-572.000.

NSK-Warner K.K.: *See—*
Hirata, Kazumi, 4,572,457, Cl. 242-107.40A.
Makishima, Yoshihiro, 4,572,456, Cl. 242-107.40D.

Numata, Kunio; and Nishiyama, Yoshiaki, to NCR Corporation. Switching regulator with a quiescent time period. 4,573,112, Cl. 363-19.000.

N.V. Maatschappij Voor Studie, Bijstand en Onderzoek "M.S.B.O.": *See—*
Bekaert, Marc, 4,572,857, Cl. 428-117.000.

N.V. Nederlandsche Apparatenfabriek Nedap: *See—*
Fockens, Tallienco W. H., 4,572,976, Cl. 307-524.000.

Ny, Nils O., to RCA Corporation. Video disc system having true and complemented digital auxiliary information codes. 4,573,085, Cl. 358-342.000.

Nyffeler, Urs: *See—*
Gaisch, Helmut; and Nyffeler, Urs, 4,572,219, Cl. 131-308.000.

Nyman, Sigurd P. Fishing tackle including line releasing float. 4,571,878, Cl. 43-43.110.

Oates, Robert M.; Cooper, Herbert C.; and Houser, Kirk D., to Westinghouse Electric Corp. Optical data distribution network with listen-while-talk capabilities. 4,573,215, Cl. 455-607.000.

Obama, Yoshiaki; and Asami, Shojiro, to Sony Corporation. Disc cassette loading apparatus. 4,573,093, Cl. 360-97.000.

Obeck, Carl J., to Bourse Trading Company, Ltd. Traffic signal light control for emergency vehicles. 4,573,049, Cl. 340-924.000.

Obenluneschloss, Kurt: *See—*
Eisermann, Armin; ten Eicken, Heinz; Obenluneschloss, Kurt; and Geiger, Diethard, 4,572,348, Cl. 194-248.000.

Ochiai, Michihiko: *See—*
Matsuo, Taisuke, deceased; Ochiai, Michihiko; and Kishimoto, Shoji, 4,572,801, Cl. 260-245.400.

Oda, Hiroyuki: *See—*
Yokooku, Katsuhiko; Seo, Nobuhide; Oda, Hiroyuki; and Yatomi, Satoshi, 4,572,031, Cl. 74-866.000.

Oda, Satoshi: *See—*
Satake, Toshimi; Minami, Toshiaki; Fujimura, Fumio; Oda, Satoshi; and Magami, Masato, 4,573,062, Cl. 346-209.000.

O'Donnell & Associates, Inc.: *See—*
Porowski, Jan S.; and O'Donnell, William J., 4,572,548, Cl. 285-15.000.

O'Donnell, William J.: *See—*
Porowski, Jan S.; and O'Donnell, William J., 4,572,548, Cl. 285-15.000.

Offerman, Karl B.: *See—*
Barton, William M., Jr.; Murphy, John F.; Offerman, Karl B.; and Fisher, Richard G., 4,573,091, Cl. 360-93.000.

Officina Meccanica Tessile Edera S.p.A.: *See—*
Chiari, Natale; and Inverardi, Giuseppe, 4,571,930, Cl. 57-274.000.

Officine Minnetti Di Federico Minnetti & C.S.A.S.: *See—*
Raveggi, Ornella, 4,572,066, Cl. 100-295.000.

Ogata, Takashi; Tasaki, Hiroshi; and Kasai, Shunichi, to Nihon Kogyo Kabushiki Kaisha. Process for rhenium recovery. 4,572,823, Cl. 423-49.000.

Ogawa, Chuck C.: *See—*
Rochat, Daniel F.; Ogawa, Chuck C.; and Bui, Uyen D., 4,573,011, Cl. 324-158.00F.

Ogawa, Masaki; Hirata, Yasushi; and Tsuchikura, Akira, to Bridgestone Corporation. Pneumatic radial tire. 4,572,263, Cl. 152-537.000.

Ogawa, Yasuaki: *See—*
Kigasawa, Kazuo; Shimizu, Hiroaki; Hayashi, Toshihiro; Watabe, Kazuo; Tanizaki, Akira; Koyama, Osamu; Wakisaka, Kikuo; and Ogawa, Yasuaki, 4,572,832, Cl. 424-19.000.

Ogino, Takao: *See—*
Umezawa, Yujiro; Sano, Shigehisa; and Ogino, Takao, 4,572,264, Cl. 152-451.000.

Oguni, Takayuki: *See—*
Ikeya, Hirotoshi; Suzuki, Shuichi; Oguni, Takayuki; Matsumoto, Kazutaka; and Hatanaka, Akiko, 4,572,853, Cl. 428-76.000.

Ogura, Makoto: *See—*
Masaki, Yuichi; and Ogura, Makoto, 4,572,617, Cl. 350-339.00R.

Ogura, Michio: *See—*
Hashiyama, Hideshi; Araki, Shuichi; and Ogura, Michio, 4,573,201, Cl. 382-56.000.

Ogura, Tokihiko: *See—*
Tezuka, Nobuo; and Ogura, Tokihiko, 4,573,087, Cl. 360-60.000.

Oguri, Itsuro; and Miyamoto, Yasuhiro, to NGK Insulators, Ltd. Cast iron mold for plastic molding. 4,572,751, Cl. 148-35.000.

Ohfuji, Mitsuo: *See—*
Nouthuka, Hirofumi; and Ohfuji, Mitsuo, 4,572,134, Cl. 123-438.000.

Ohhashi, Masahide, to Tokyo Shibaura Denki Kabushiki Kaisha. Adder circuit. 4,573,137, Cl. 364-788.000.

Ohki, Hiroshi: *See—*
Tanaka, Masashi; and Ohki, Hiroshi, 4,572,623, Cl. 350-480.000.

Ohkoshi, Yasuo: *See—*
Amano, Tadashi; Sato, Yasuaki; and Ohkoshi, Yasuo, 4,572,657, Cl. 355-38.000.

Ohno, Shigeru: *See—*
Saitoh, Keishi; Ohnuki, Yukihiko; and Ohno, Shigeru, 4,572,882, Cl. 430-57.000.

Ohnuki, Yukihiko: *See—*
Saitoh, Keishi; Ohnuki, Yukihiko; and Ohno, Shigeru, 4,572,882, Cl. 430-57.000.

Ohta, Kenji: *See—*
Deguchi, Toshihisa; Ohta, Kenji; Takahashi, Akira; and Yamaoka, Hideyoshi, 4,573,149, Cl. 369-13.000.

Oinoue, Kenichi, to Olympus Optical Company Limited. Method for detecting a focus condition of an imaging optical system employing interpolated signal values. 4,572,476, Cl. 250-201.000.
Oizumi, Masayuki: *See—*
Fushiki, Yasuo; Abe, Masaharu; and Oizumi, Masayuki, 4,572,859, Cl. 428-215.000.
Oka, Tateki: *See—*
Yuge, Shizuo; Oka, Tateki; Sakakibara, Susumu; and Toyoshi, Naoki, 4,572,102, Cl. 118-689.000.
Okada, Aguri: *See—*
Takamizawa, Daisuke; Okada, Aguri; and Ito, Hisayoshi, 4,572,593, Cl. 312-114.000.
Okada, Tokio; Kojima, Shigezo; and Tani, Haruhisa, to Polymer Processing Research Institute, Ltd.; and Bouligny Company, The. Method of and apparatus for thermally treating fiber yarns. 4,571,765, Cl. 8-149.300.
Okamoto, Takamitsu; and Takeda, Keisou, to Toyota Jidosha Kabushiki Kaisha. Fuel injection carburetor in internal combustion engine. 4,572,128, Cl. 123-339.000.
Okano, Takeshi: *See—*
Takahashi, Michihiko; Saito, Eiichi; and Okano, Takeshi, 4,572,649, Cl. 355-3.00R.
Okayasu, Hiromasa: *See—*
Saito, Hiroshi; Okayasu, Hiromasa; Tsuyuki, Shinichi; Kawana, Takeshi; Mifune, Takao; and Yoshizaki, Masanori, 4,571,822, Cl. 29-736.000.
Okazaki, Fumio, to Yoshida Kogyo K. K. Separable bottom-end-stop assembly for separable slide fastener. 4,571,784, Cl. 24-433.000.
Okitaka, Isao: *See—*
Kaieda, Osamu; Hirota, Koichi; Okitaka, Isao; and Nakamura, Toshiaki, 4,572,805, Cl. 260-465.00D.
Okoshi, Hideo, to Nippon Seiko Kabushiki Kaisha. Infinitely variable traction roller transmission. 4,572,016, Cl. 74-200.000.
Okuda, Masakiyo, to Sharp Kabushiki Kaisha. Size detecting device of a copy document suitable for electrophotographic copying machine. 4,572,650, Cl. 355-3.0SH.
Oleo International Holdings Limited: *See—*
Williams, Derrick G.; Thurlow, John; and Bushnell, John J., 4,572,080, Cl. 104-252.000.
Olimpic Di Costa Lorenzo & C. S.N.C.: *See—*
Costa, Giancarlo, 4,571,862, Cl. 38-77.810.
Olin Corporation: *See—*
Lewis, Brian G.; and Patton, John V., 4,572,279, Cl. 164-463.000.
Oliver, John P.: *See—*
Gluck, David G.; DeLeon, Alberto; and Oliver, John P., 4,572,865, Cl. 428-309.900.
Olofsson, Sigfrid M.; and Wickenberg, Chester H. Air guns with floating piston received in compensating chamber which is formed in main piston. 4,572,152, Cl. 124-69.000.
Olsson, Mats J.: *See—*
Nordenstrom, Bjorn E. W.; and Olsson, Mats J., 4,572,214, Cl. 128-785.000.
Olympus Optical Co., Ltd.: *See—*
Imai, Masaharu, 4,573,077, Cl. 358-212.000.
Inoue, Akira, 4,572,637, Cl. 354-173.110.
Kaneko, Nobutaka, 4,572,671, Cl. 356-444.000.
Kikuchi, Juro, 4,572,620, Cl. 350-427.000.
Oinoue, Kenichi, 4,572,476, Cl. 250-201.000.
Yoshida, Yoichi; Hashimoto, Akihiko; Suzuki, Tatsuya; Shirai, Hitoshi; Akitake, Hiroshi; and Nakazawa, Hirotsugu, 4,572,645, Cl. 354-435.000.
Omata, Takashi, to Canon Kabushiki Kaisha. Illuminating apparatus. 4,572,659, Cl. 355-67.000.
O'Meara, Thomas R., to United States of America, Air Force. Phase-conjugate resonator with a double SBS mirror. 4,573,157, Cl. 372-19.000.
Omnis Surgical Inc.: *See—*
Leonard, Ronald J.; and Johnson, Kenneth M., 4,572,446, Cl. 242-7.020.
Omori, Norio: *See—*
Kamai, Kenichiro; Omori, Norio; Kinugawa, Masumi; and Takao, Mitsunori, 4,572,122, Cl. 123-206.000.
Omron Tateisi Electronics Co.: *See—*
Kamada, Koichiro, 4,573,104, Cl. 361-399.000.
Onal, Isik, to Signal Applied Technologies Inc. Lead-tolerant catalyst system for treating exhaust gas containing lead compounds. 4,572,904, Cl. 502-333.000.
Ong, Richard H.; Economopoulos, Peter C.; and Guenthner, Russell W., to Honeywell Information Systems Inc. Multiword data register array having simultaneous read-write capability. 4,573,116, Cl. 364-200.000.
Ono, Satoshi; Sugita, Hiroshi; and Hiramitsu, Tetsushi, to Toyoda Gosei Co., Ltd. Relay arrangement for steering wheel. 4,572,313, Cl. 180-78.000.
Ono, Toyoichi: *See—*
Hashimoto, Haruo; and Ono, Toyoichi, 4,572,131, Cl. 123-357.000.
Onoda Cement Co., Ltd.: *See—*
Ueda, Yoshihiko; Saito, Ikuo; Sakae, Kazumasa; and Oogiri, Tetuo, 4,572,082, Cl. 110-245.000.
Onodera, Toshihiro: *See—*
Tanaka, Shigeru; and Onodera, Toshihiro, 4,573,184, Cl. 378-110.000.
Onopchenko, Anatoli; and Sabourin, Edward T., to Gulf Research & Development Company. Production of saturated and unsaturated silahydrocarbon mixtures using rhodium catalyst, and to products produced thereby. 4,572,791, Cl. 252-46.300.
Oodaira, Hirosi: *See—*
Saito, Masayuki; Suzuki, Haruko; and Oodaira, Hirosi, 4,572,843, Cl. 427-53.100.
Oogiri, Tetuo: *See—*
Ueda, Yoshihiko; Saito, Ikuo; Sakae, Kazumasa; and Oogiri, Tetuo, 4,572,082, Cl. 110-245.000.
Ootani, Hisao: *See—*
Horiuchi, Yusuke; and Ootani, Hisao, 4,572,344, Cl. 192-106.100.
Opprecht, Paul; and Weil, Wolfgang, to Soudronic AG. Method of electrical resistance roll seam welding with only one electrode wire, machine for performing the process and use of the process. 4,572,937, Cl. 219-83.000.
Orchard, Stanley E.; and Taylor, Celia C., to Imperial Chemical Industries PLC. Surface coating characterization method and apparatus. 4,572,672, Cl. 356-446.000.
Ordu, Armin, to Daimler-Benz Aktiengesellschaft. Vehicle wheel with internally located emergency wheel. 4,572,260, Cl. 152-158.000.
Orenstein, Ira. Fluid diffuser and method for constructing the same. 4,571,948, Cl. 60-641.800.
Orera, Victor M.: *See—*
Abraham, Marvin M.; Boldu, Jose L.; Chen, Yok; and Orera, Victor M., 4,572,618, Cl. 350-354.000.
Orevik, Sune A. W.; and Gronberg, Torsten R., to Telefonaktiebolaget L M Ericsson. Clip for pipes, hoses and the like. 4,572,552, Cl. 285-253.000.
Ortho Pharmaceutical (Canada) Ltd.: *See—*
Livesay, Billy R.; Tatum, Howard J.; and Toews, Melvin R., 4,572,162, Cl. 128-1.00R.
Orthotronics Limited Partnership: *See—*
Fraser, Gregory A.; and Raab, Simon, 4,571,834, Cl. 33-1.0PT.
Osaka Gas Company Limited: *See—*
Nakamura, Syuichi; and Morioka, Masakazu, 4,573,016, Cl. 324-326.000.
Ostrander, William J.: *See—*
Herkenhoff, Earl F.; and Ostrander, William J., 4,573,148, Cl. 367-47.000.
Ostrem, John S.: *See—*
Crane, Hewitt D.; and Ostrem, John S., 4,573,196, Cl. 382-13.000.
Osujo, Masahide, to Kubota, Ltd. Change-speed maneuvering apparatus incorporated in a vehicle. 4,571,786, Cl. 74-485.000.
Oswald, Norman D.; and Mankey, Harry S. Walking beam arrangement for adverse terrain vehicle. 4,572,311, Cl. 180-6.480.
Ota, Akiho; and Negishi, Fumio, to Yoshino Kogyosho Co., Ltd. Method for producing polyester containers. 4,572,811, Cl. 264-25.000.
Otis Engineering Corporation: *See—*
Dollison, William W., 4,571,939, Cl. 60-372.000.
Otobe, Yutaka, to Honda Giken Kogyo K.K. Air-fuel ratio feedback control method for internal combustion engines. 4,572,129, Cl. 123-440.000.
Otsap, Ben A. Oxygen therapy apparatus. 4,572,177, Cl. 128-205.170.
Otsuka Pharmaceutical Co., Ltd.: *See—*
Shimizu, Fumio; Tachikawa, Tetsuya; Ikei, Nobuhiro; Noda, Atunari; Hashimura, Etsuro; and Imagawa, Kenichi, 4,572,800, Cl. 260-112.50R.
Otsuka, Tadao: *See—*
Hattori, Takashi; and Otsuka, Tadao, 4,572,537, Cl. 280-433.000.
Otto Fastening Systems Ltd.: *See—*
Hoeksema, Ari H., 4,572,694, Cl. 403-187.000.
Otton Dunkel GmbH Fabrik fur Elektrotechnische Gerate: *See—*
Neumann, Bernhard; and Ramisch, Rainer, 4,572,606, Cl. 339-262.00R.
Outboard Marine Corporation: *See—*
Bailey, Francis V., 4,572,850, Cl. 427-430.100.
Foster, Leslie W., 4,572,150, Cl. 123-602.000.
Winston, John H., 4,572,762, Cl. 156-556.000.
Owen, Hartley; and Schatz, Klaus W., to Mobil Oil Corporation. Multistage stripper for FCC unit with catalyst separation by spinning. 4,572,780, Cl. 208-161.000.
Owens-Corning Fiberglas Corporation: *See—*
Thompson, Thomas K., 4,572,435, Cl. 239-553.500.
Ozawa, Takashi, to NEC Corporation. Signal transmitting circuit. 4,573,145, Cl. 365-194.000.
Ozen Corporation: *See—*
Koike, Eishi, 4,573,150, Cl. 369-67.000.
P. A. Rentrop Hubbert & Wagner Fahrzeugausstattungen GmbH & Co. KG: *See—*
Lange, Dieter; and Deptolla, Bernd, 4,572,468, Cl. 248-394.000.
P & H Logging Co., Inc.: *See—*
Page, Dennis J., 4,572,562, Cl. 294-74.000.
Page, Dennis J., to P & H Logging Co., Inc. Lifting sling. 4,572,562, Cl. 294-74.000.
Pakosh, Daniel, to Versatile Corporation. Splitter blade for threshing rotor. 4,572,215, Cl. 130-27.00R.
Palfery, Kenneth J.; and Maharaj, Kenrick B. Automated machining system. 4,571,814, Cl. 29-568.000.
Palka, Robert E.: *See—*
Driscoll, John S.; and Palka, Robert E., 4,572,452, Cl. 242-56.200.
Pall Corporation: *See—*
Rosenberg, David J.; and Matkovich, Vlado I., 4,572,724, Cl. 55-159.000.
Palmer, Hans J.: *See—*
Dallmann, Hermann; and Palmer, Hans J., 4,572,854, Cl. 428-35.000.
Pangburn, William E., to Haefliger, William W., a part interest. Use of flexible abrasive pad for wet etching of fingernails. 4,572,222, Cl. 132-76.400.

Paniagua, Juan G. Apparatus for sterilizing fluids. 4,572,775, Cl. 204-229.000.
Paramount Packaging Corp.: *See—*
Peppiatt, Harry R., 4,573,203, Cl. 383-8.000.
Parcell, Clive L.: *See—*
Chestnut, William R.; Parcell, Clive L.; Cox, Christopher J.; and MacKenzie, David J., 4,572,346, Cl. 192-134.000.
Parks-Cramer Company: *See—*
House, Thomas R., 4,572,745, Cl. 134-10.000.
Parsons, Albert; and Havens, H. Norris, to Consolidated Systems, Inc. Universal concrete screed system. 4,572,701, Cl. 404-50.000.
Pastor, Sheldon L.; and Louks, John W., to Minnesota Mining and Manufacturing Company. Stretched surface recording disk and method of manufacture. 4,573,097, Cl. 360-135.000.
Patent-Treuhand Gesellschaft fur electrische Gluhlampen mbH: *See—*
Zuchtriegel, Anton, 4,572,989, Cl. 315-209.00R.
Patton, John V.: *See—*
Lewis, Brian G.; and Patton, John V., 4,572,279, Cl. 164-463.000.
Paul, Raymond E.: *See—*
Hug, Paul; Umeda, William; Chapdelaine, Paul; and Paul, Raymond E., 4,572,421, Cl. 228-103.000.
Paulsen, David L.: *See—*
Tribolet, David C.; and Paulsen, David L., 4,573,129, Cl. 364-520.000.
Pawloski, James A.; and Williams, Grahame F. Fluid actuated tool. 4,571,975, Cl. 72-325.000.
Payne, David E. Boat construction. 4,572,096, Cl. 114-88.000.
Pearl, David R., to Gerber Garment Technology, Inc. Sheet material conveyor with unloading apparatus. 4,572,357, Cl. 198-693.000.
Pease, Roger F. W.: *See—*
Tuckerman, David B.; and Pease, Roger F. W., 4,573,067, Cl. 357-82.000.
Peck, Lawrence B., to Standard Oil Company (Indiana). Recovery of a carbonaceous liquid with a low fines content. 4,572,777, Cl. 208-11.0LE.
Pedersen, Arne M.; and Jensen, Jens R., to A/S Alfred Benzon. Method for preparing a pharmaceutical controlled release composition. 4,572,833, Cl. 424-20.000.
Pedron, Thierry: *See—*
Lefebvre, Jean-Paul; and Pedron, Thierry, 4,573,126, Cl. 364-481.000.
Pegram, Warren J.; and Sergeant, Ronald G., to AMP Incorporated. Wire shuffling apparatus and method. 4,572,248, Cl. 140-92.100.
Pengo Industries, Inc.: *See—*
Rosenthal, Wayne O., 4,572,289, Cl. 166-123.000.
Penn Plax Plastics, Inc.: *See—*
Goldman, Jerome N.; Goldman, Marvin A.; and Philips, Gerald A., 4,571,766, Cl. 15-105.000.
Penta Construction Corp.: *See—*
Arato, Michael P., 4,572,431, Cl. 238-283.000.
Peppiatt, Harry R., to Paramount Packaging Corp. Reusable plastic bag with loop handle. 4,573,203, Cl. 383-8.000.
Perkins, Patricia A. Back rest. 4,572,578, Cl. 297-460.000.
Perlin, Samuel. Cut away lounge and/or bed. 4,571,761, Cl. 5-431.000.
Pernet, Andre G.: *See—*
Nadzan, Alex M.; Pernet, Andre G.; and Hanessian, Stephen, 4,572,907, Cl. 514-25.000.
Pernod, Roger: *See—*
Guitteny, Jean-Louis; Pernod, Roger; Roques, Christian; and Tran Van, Guy, 4,572,839, Cl. 426-646.000.
Peroff, George A. Sinker for a fishing line. 4,571,879, Cl. 43-44.970.
Peroxide-Chemie GmbH: *See—*
Sebb, Werner; and Dammann, Heinrich, 4,572,825, Cl. 423-173.000.
Perrot, Alain C.: *See—*
Le Cacheux, Paul; Schuch, Andre; and Perrot, Alain C., 4,571,898, Cl. 52-36.000.
Peter, Timothy J., to Ransomes, Inc. Drive system for a vehicle. 4,572,310, Cl. 180-6.240.
Peterson, James R., to Texas Instruments Incorporated. Method for cleaning an electrode. 4,572,772, Cl. 204-141.500.
Peterson, Jerry A.: *See—*
Ceriani, Roberto L.; and Peterson, Jerry A., 4,572,901, Cl. 436-528.000.
Peterson, William A., Jr.: *See—*
Wakeman, Russell J.; Wright, Danny O.; and Peterson, William A., Jr., 4,571,996, Cl. 73-202.000.
Petri, Bernd; and Riffel, Jurgen, to Standardwerk Eugen Reis GmbH. Apparatus for counting coins or similar discs. 4,572,225, Cl. 133-8.00E.
Petrosky, Kenneth J., to United States of America, Air Force. Bi-directional current differencer for complementary charge coupled device (CCD) outputs. 4,573,177, Cl. 377-60.000.
Petty, Thomas D., to Motorola, Inc. SCR Fire sensitivity control and fire control apparatus. 4,572,968, Cl. 307-252.00G.
Peyre, Henri: *See—*
Bernard, Jean; Beyl, Jean; le Faou, Daniel; Peyre, Henri; and Viodet, Patrice, 4,572,541, Cl. 280-628.000.
Pfaff Aktiengesellschaft: *See—*
Gustmann, Kurt; Brandt, Siegard; and Sourisseaux, Ludwig, 4,572,091, Cl. 112-229.000.
Pfaff Industriemaschinen GmbH: *See—*
Wenz, Herbert; and Becker, Dietmar, 4,572,093, Cl. 112-256.000.
Pfeuffer, Donald F.: *See—*
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Pfizer Inc.: *See—*
Campbell, Simon F.; Cross, Peter E.; Stubbs, John K.; and Arrowsmith, John E., 4,572,908, Cl. 514-340.000.
Campbell, Simon F.; Cross, Peter E.; and Stubbs, John K., 4,572,909, Cl. 514-356.000.
Phil Wood & Co.: *See—*
Wood, Philip, 4,571,971, Cl. 72-90.000.
Philip Morris Incorporated: *See—*
Wheless, Jack C.; and Dickerson, Richie H., 4,571,917, Cl. 53-148.000.
Philips, Gerald A.: *See—*
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Philips Industrial Components, Inc.: *See—*
Van Becelaere, Robert M., 4,572,240, Cl. 138-92.000.
Phillips, Douglas D. Change-configuration climbing chock. 4,572,464, Cl. 248-1.000.
Phillips, Geoff. Multi-function tickler filing system. 4,572,547, Cl. 283-36.000.
Phillips, James E., Sr. Paper dispensing apparatus. 4,572,761, Cl. 156-511.000.
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Phillips Petroleum Company: *See—*
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Phlipot, James R.; Pinkston, Steve R.; and Seghetti, Leland L., to Essex Industries, Inc. Regulated gas flow control valve. 4,572,477, Cl. 251-285.000.
Photo Engineering International s.r.l.: *See—*
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Piecha, Gottfried: *See—*
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Pikulski, Richard: *See—*
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Pinnow, Douglas A., to Universal Photonics, Inc. Watch apparatus and method for a universal electronic locking system. 4,573,046, Cl. 340-825.560.
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Pirl, William E.; and Vogeleer, John P., to Westinghouse Electric Corp. Sleeve insertion. 4,571,821, Cl. 29-727.000.
Pistorius, Albert. Hand lever operated vee nail frame assembly machine. 4,572,420, Cl. 227-110.000.
Pitney Bowes Inc.: *See—*
Crowley, Raymond R.; Eckert, Alton B.; and Soderberg, John H., 4,573,174, Cl. 377-39.000.
Pitzer, Emory W., to Phillips Petroleum Company. Attrition resistant particles and preparation of same. 4,572,439, Cl. 241-1.000.
Piwonka, Fridolin, to Robert Bosch GmbH. Electronic control system for a diesel injection system of an internal combustion engine. 4,572,132, Cl. 123-357.000.
Placo Molders Inc.: *See—*
Inkel, Marcel, 4,572,462, Cl. 242-199.000.
Plummer, Walter A., III. Shielded re-enterable jacket with dielectric spacer and method of making same. 4,572,922, Cl. 174-36.000.
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Scully, John W., 4,571,926, Cl. 53-525.000.
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Poetzschke, Manfred; and Sattler, Hans-Peter, to Metallgesellschaft Aktiengesellschaft; Eumet Metallaufbereitungsgesellschaft mbH & Co.; and RTZ Ore Sorters (North America) Inc. Process for sorting metal particles. 4,572,735, Cl. 75-10.00R.
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Polaroid Corporation: *See—*
Lindquist, Kenneth L., 4,572,450, Cl. 242-56.00R.
Livingston, James J.; and Sorli, Duncan C., 4,572,634, Cl. 354-84.000.
Polett, Walter J. Slide fastener for flexible bulk container. 4,573,204, Cl. 383-41.000.
Politzer, Anton; Heberlein, Werner; and Konicke, Helmut, to Diehl GmbH & Co. Caseless ammunition for automatic weapons. 4,572,076, Cl. 102-431.000.
Poll, Marian. Pantograph. 4,571,836, Cl. 33-25.00B.
Pollak, Werner; Blecha, Michael; and Specht, Gerhard, to Hoechst CeramTec Aktiengesellschaft. Process for the production of molded

bodies from silicon-infiltrated, reaction-bonded silicon carbide. 4,572,848, Cl. 427-294.000.

Pollhammer, Edgar; Ritter, Klaus; and Ritter, Gerhard, to EVG Entwicklungs- u. Verwertungs-Gesellschaft mbH. Bending machine for wire or strip material. 4,571,974, Cl. 72-217.000.

Polymer Processing Research Institute, Ltd.: *See—*
Okada, Tokio; Kojima, Shigezo; and Tani, Haruhisa, 4,571,765, Cl. 8-149.300.

Ponzi, Renato; and Ellenberg, Martin, to El.PO s.r.l. Apparatus designed for filling containers with liquid/paste substances under sterile conditions. 4,572,252, Cl. 141-90.000.

Pool, James L., to Lisle Corporation. Speedometer cable lubrication tool. 4,572,332, Cl. 184-15.100.

Poole, Stephen; West, Stuart I.; and Walters, Clifford L., to British Food Manufacturing Industries Research Association, The. Protein product. 4,572,837, Cl. 426-564.000.

Popp, Franz-Wolfgang; and Feuring, Kurt, to Deutsche Gesellschaft fur Wiederaufarbeitung von Kernbrennstoffen mbH. Container for the interim and long-term storage of radioactive material. 4,572,959, Cl. 250-506.100.

Porowski, Jan S.; and O'Donnell, William J., to O'Donnell & Associates, Inc. Pipelock. 4,572,548, Cl. 285-15.000.

Porta Systems Corp.: *See—*
Fasano, Michael, 4,573,100, Cl. 361-119.000.

Porter, Malcolm; and Dodgson, Robert, to British Steel Corporation. Treatment of molten materials. 4,572,673, Cl. 366-127.000.

Postma, Arlin K., to United States of America, Energy. Thermophoretic separation of aerosol particles from a sampled gas stream. 4,572,007, Cl. 73-863.120.

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Powell, John H.; and Callahan, James J., to Lubriquip - Houdaille, Inc. Reversible feeder system. 4,572,331, Cl. 184-7.400.

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Prahl, Jan, to IPOS Gesellschaft fur integrierte Prothese-Entwicklung und orthopadietechnischen Service mbH & Co. KG. Arch support especially for the therapy of pes valgus in children. 4,572,196, Cl. 128-581.000.

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Pratt, David C.; and Albanese, James J., Jr., to Seachem, a division of Pittway Corp. Aerosol container and valve assembly for automatically signalling depletion of a predetermined amount of the container contents when in an inverted position. 4,572,406, Cl. 222-39.000.

Precision Monolithics, Inc.: *See—*
Bowers, Derek F., 4,572,975, Cl. 307-498.000.

Price, Samuel T., to Enterprise Machine and Development Corp. Air jet texturing system for the production of uniform textured yarn. 4,571,793, Cl. 28-220.000.

Priddy, Duane B.; and Pirc, Michael, to Dow Chemical Company, The. Apparatus for anionic polymerization whercin the molecular weight of the polymer is closely controlled. 4,572,819, Cl. 422-62.000.

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Pritchard, Robert J.: *See—*
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Procter & Gamble Company, The: *See—*
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Proebsting, Robert J.: *See—*
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Professional Associated Consulting Engineers Incorporated: *See—*
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Propson, James A.: *See—*
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Prototypes, Ltd.: *See—*
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Pruvost, Bernard, to S.K.F. Compagnie d'Application Mecaniques & Compagnie. Process for manufacturing ball joints or other self-lubricated joints. 4,571,811, Cl. 29-436.000.

Pryputniewicz, Ryszard J.; Clayton, John; and Waters, Robert A., to Waters Manufacturing, Inc. Wiper for sliding electrical contact. 4,572,599, Cl. 339-5.00R.

Punater, Dinesh G.; and Graves, Gene E., to Harris Graphics Corporation. Quick change slitter wheel holder. 4,572,047, Cl. 83-481.000.

Purdue Research Foundation: *See—*
Geddes, Leslie A.; and Grubbs, David S., 4,572,206, Cl. 128-692.000.

Puumalainen, Pertti; and Sikanen, Pertti, to Enso-Gutzeit Oy. Means for creating an electron curtain. 4,572,957, Cl. 250-493.100.

Quadra Wheelchairs, Inc.: *See—*
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Quinty, Christian: *See—*
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Quitmann, Horst; and Bangert, Dieter, to Alfred Teves GmbH. Screw cap having vent means. 4,572,395, Cl. 220-203.000.

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Rabe, James A.: *See—*
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Racal Safety Limited: *See—*
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Raceway Components, Inc.: *See—*
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Raemaekers, Karel G. H.: *See—*
Biermans, Andreas J.; Burks, Henk C.; and Raemaekers, Karel G. H., 4,572,676, Cl. 374-17.000.

Ragland, Frank R., Jr., to RCA Corporation. Color picture tube having an improved support structure for a color selection electrode. 4,572,983, Cl. 313-405.000.

Ram Automotive Company: *See—*
Wheatley, William M., 4,572,140, Cl. 123-541.000.

Ramisch, Rainer: *See—*
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Ramsay, Jean R. Static ventilator construction. 4,572,059, Cl. 98-42.220.

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Rasca, Luigi, to Silem s.r.l. Device for installing automobile radios on automobile dash panels by frontal application and without the use of screws. 4,572,465, Cl. 248-27.100.

Rasmussen, Poul L. Method for reducing chromate dermatitis. 4,572,739, Cl. 106-101.000.

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Rauch, George W., to General Propeller Company. Key stop for a marine propeller shaft. 4,572,698, Cl. 403-356.000.

Rautio, Kauko. Saw machine. 4,572,256, Cl. 144-39.000.

Raveggi, Ornella, to Officine Minnetti Di Federico Minnetti & C.S.A.S. Apparatus for applying a lengthening rod and for reel pressing in connection with a dyeing basket for yarn reels. 4,572,066, Cl. 100-295.000.

Rawls, Henry R.; and Zimmerman, Barbara F., to Research Corporation. Fluoride interpolymeric resin. 4,572,920, Cl. 523-115.000.

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RCA Corporation: *See—*
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Bolger, Thomas V., 4,573,075, Cl. 358-167.000.
Dieterich, Charles B., 4,573,135, Cl. 364-724.000.
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Dorsey, Denis P.; Sepp, Walter E.; and Pritchard, Dalton H., 4,573,068, Cl. 358-11.000.
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Haferl, Peter E., 4,572,993, Cl. 315-408.000.
Kaganowicz, Grzegorz; and Robinson, John W., 4,572,841, Cl. 427-39.000.
Kolodin, Louis, 4,573,033, Cl. 340-347.0DA.
Lewis, Henry G., Jr., 4,573,069, Cl. 358-27.000.
Maze, Kenneth W., 4,573,080, Cl. 358-140.000.
Ny, Nils O., 4,573,085, Cl. 358-342.000.

Ragland, Frank R., Jr., 4,572,983, Cl. 313-405.000.
Reeder, Jereld R., 4,573,081, Cl. 358-231.000.
Rentsch, Edward M.; and Freedman, Larry A., 4,573,078, Cl. 358-213.000.
Yeager, Richard O., 4,573,176, Cl. 377-48.000.
Reeder, Jereld R., to RCA Corporation. Frequency selective video signal compression. 4,573,081, Cl. 358-231.000.
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Reininger, Siegfried; and Wiesmeier, Albert, to Daimler-Benz Aktiengesellschaft. Electrically dimmable rear-view mirror for motor vehicles. 4,572,619, Cl. 350-392.000.
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Reith, Walter: *See*—
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Rentsch, Edward M.; and Freedman, Larry A., to RCA Corporation. Method for operating a CCD imager of the field transfer type. 4,573,078, Cl. 358-213.000.
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Rieger, Werner; Dalferth, Hans H.; and Eberhardt, Franz, to RUD-Kettenfabrik Rieger & Dietz GmbH u. Co. Chain with chain links of welded round material. 4,571,934, Cl. 59-90.000.
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Roach, Henry P.; and Gunn, Jeffrey W., to APV Burnett & Rolfe, Inc. Beer keg capping machine. 4,571,920, Cl. 53-300.000.
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Roberts, James R., to A. O. Smith Harvestoe Products, Inc. Apparatus for agitating and pumping a liquid slurry. 4,572,675, Cl. 366-263.000.
Roberts, Thomas G.; and Honeycutt, Thomas E., to United States of America, Army. Waveguide phase conjugate mirror. 4,571,954, Cl. 62-514.00R.
Robinson, Bobby L.: *See*—
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Robinson, McDonald; Weston, Harry T.; and Wong, Yiu H., to AT&T Bell Laboratories. Isolation process for high-voltage semiconductor devices. 4,571,818, Cl. 29-576.00W.
Robinson, Stewart W.; Bartram, Roger W.; and Dehuff, John A., to BOC Group, Inc., The. Agents for the removal of impurities from a molten metal and a process for producing same. 4,572,737, Cl. 75-53.000.
Robinson, William. Arrangement for cyclone assemblies for cleaning liquid suspensions. 4,572,787, Cl. 210-512.200.
Robinton, Michael A.; and Starkie, Alan H., to Robinton Products, Inc. Analog-to digital converter and method. 4,573,037, Cl. 340-347.0NT.
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Robison, Robert E. Well casing scraper. 4,572,291, Cl. 166-173.000.
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Rochat, Daniel F.; Ogawa, Chuck C.; and Bui, Uyen D., to Nouvas Manufacturing Technology Company. Method and apparatus for testing electro-mechanical devices. 4,573,011, Cl. 324-158.00F.
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Havens, Donald P., 4,573,028, Cl. 333-198.000.
Hepworth, Mark N., 4,572,966, Cl. 307-200.00A.
James, Kenneth A.; Quick, William H.; and Strahan, Virgil H., 4,572,669, Cl. 356-352.000.
McMahon, Michael F., Jr.; and Lavenz, James M., 4,573,171, Cl. 375-114.000.
White, Stanley A., 4,573,133, Cl. 364-571.000.
Rockwood, Robert E.; Antkowiak, Richard P.; and Hill, Douglas J., to A. W. Chesterton Company. Labyrinth ring seals with housing mounting means. 4,572,517, Cl. 277-53.000.
Rodriguez, Jose V.: *See*—
Krasuk, Julio; Solari, Rodolfo B.; Aquino, Luis G.; Rodriguez, Jose V.; and Granados, Alejandro, 4,572,781, Cl. 208-309.000.
Roeske, Klaus J.: *See*—
Bishop, Arthur E.; Roeske, Klaus J.; and Scott, David W., 4,571,982, Cl. 72-400.000.

Rogers, Philip L., to Lockheed Corporation. Fluorescent air data measurement device. 4,572,667, Cl. 356-317.000.
Rogers, Steven H.; Mundt, Randall S.; and Kaya, Denise A., to NCR Corporation. Method for forming trench isolation structures. 4,571,819, Cl. 29-576.00W.
Rohde, Dieter: *See—*
Entmayr, Peter; Rohde, Dieter; and Thielemann, Klaus, 4,572,262, Cl. 152-501.000.
Rohner, Joachim, to W. Schlafhorst & Co. Splicing head operated by compressed air. 4,571,928, Cl. 57-22.000.
ROJ Electrotex S.p.A.: *See—*
Ghiaro, Fiorenzo, 4,572,246, Cl. 139-435.000.
Rolls-Royce Ltd.: *See—*
McMurtry, David R., 4,571,847, Cl. 33-503.000.
Mills, David, 4,572,272, Cl. 164-131.000.
Rolscreen Company: *See—*
Minter, Mearl, 4,571,899, Cl. 52-60.000.
Romberger, John: *See—*
Breakey, Fred B.; Barber, Leo D.; Chapman, Richard L.; Godin, Norman; Henry, Robert; Jackson, Claude; Romberger, John; and Seidl, Rudolph, 4,572,381, Cl. 211-94.000.
Ronge, Johann: *See—*
Fischhaber, Nikolaus; and Ronge, Johann, 4,572,574, Cl. 297-159.000.
Roques, Christian: *See—*
Guitteny, Jean-Louis; Pernod, Roger; Roques, Christian; and Tran Van, Guy, 4,572,839, Cl. 426-646.000.
Rosemount Inc.: *See—*
Kooiman, Robert R., 4,572,000, Cl. 73-718.000.
Rosen, Gerald M. Skin-marking compositions and devices, and their use. 4,572,831, Cl. 424-7.100.
Rosenberg, David J.; and Matkovich, Vlado I., to Pall Corporation. Blood filter. 4,572,724, Cl. 55-159.000.
Rosenbloom, Jack B.: *See—*
Hine, Edwin W.; and Rosenbloom, Jack B., 4,572,218, Cl. 131-302.000.
Rosenbush, David M.; and Couch, Robert P., to United Technologies Corporation. Electrostatic engine diagnostics with acceleration related threshold. 4,573,123, Cl. 364-431.020.
Rosenfeld, Marvin L., to Dentool, Inc. Dental brush holder and assembly. 4,572,223, Cl. 132-84.00R.
Rosenthal, Wayne O., to Pengo Industries, Inc. Electric wireline packer retriever apparatus. 4,572,289, Cl. 166-123.000.
Rosenwinkel, Karen W.; and Jinks, Jerry R., to W. Braun Company. Unitary tubular storage receptacle with restricted fluid dispensing control passage. 4,572,224, Cl. 132-88.500.
Rossi, Cristiano, to Robogate Systems Inc. Variable speed drive for filling cubicle container. 4,572,017, Cl. 74-394.000.
Rossiter, Timothy J. M., to ITT Industries, Inc. Sum-of-products multiplier with multiple memories and reduced total memory size. 4,573,136, Cl. 364-728.000.
Rossow, Robert O. Shock absorber tool. 4,571,809, Cl. 29-270.000.
Roth, Richard W.; Gregor, William T.; Sherwood, Michael D.; and Pokrajac, Ned, to Engineered Systems Inc. End of transaction control system. 4,573,192, Cl. 382-1.000.
Rotork Controls Limited: *See—*
Sanders, Peter G., 4,572,932, Cl. 200-17.00R.
Rott, Karl-Heinz: *See—*
Klever, Manfred; and Rott, Karl-Heinz, 4,571,861, Cl. 37-241.000.
Roustan, Michel: *See—*
Brodard, Eric; Duguet, Jean-Pierre; Mallevialle, Joel; and Roustan, Michel, 4,572,821, Cl. 422-186.120.
Roy, Glenn M.: *See—*
Zanno, Paul R.; Barnett, Ronald E.; and Roy, Glenn M., 4,572,799, Cl. 260-112.50R.
Royse, Suzanne M., to Instromedix, Inc. Notched pressure pad for an artery clamp. 4,572,182, Cl. 128-325.000.
RTZ Ore Sorters (North America) Inc.: *See—*
Poetzschke, Manfred; and Sattler, Hans-Peter, 4,572,735, Cl. 75-10.00R.
Rubino, Daniel A., to Babson Bros. Co. Method of milking. 4,572,104, Cl. 119-14.020.
RUD-Kettenfabrik Rieger & Dietz GmbH u. Co.: *See—*
Rieger, Werner; Dalferth, Hans H.; and Eberhardt, Franz, 4,571,934, Cl. 59-90.000.
Rudolph Schrepfer AG: *See—*
Schrepfer, Rudolf, 4,572,471, Cl. 248-560.000.
Rugh, Susanne: *See—*
Amotz, Shmuel; Rugh, Susanne; Markussen, Erik K.; and Thomsen, Kurt, 4,572,897, Cl. 435-177.000.
Rumsey, Stephen C.: *See—*
Joseph, Brian J.; and Rumsey, Stephen C., 4,572,417, Cl. 226-20.000.
Rupnik, David W., to AMP Incorporated. Electrical connector assembly with guide member. 4,572,602, Cl. 339-65.000.
Ruschek, Gerhard: *See—*
Vogler, Hans-Ulrich; Ruschek, Gerhard; and Schlick, Horst, 4,572,478, Cl. 251-305.000.
Ruscher, Edward H.: *See—*
Drost, Adrian D.; and Ruscher, Edward H., 4,572,521, Cl. 277-167.500.
Russell, William S. Reusable container. 4,572,425, Cl. 229-39.00R.
Rutt, Brian K., to Imatron, Inc. Scanned projection radiography using high speed computed tomographic scanning system. 4,573,179, Cl. 378-10.000.
RyBro Handelsbolag: *See—*
Sodergren, Lars-Olof; and Ryytty, Conny, 4,572,159, Cl. 126-415.000.
Ryeczek, John J. Method of mining metals located in the earth. 4,572,582, Cl. 299-5.000.
Ryytty, Conny: *See—*
Sodergren, Lars-Olof; and Ryytty, Conny, 4,572,159, Cl. 126-415.000.
S&C Electric Company: *See—*
Swanson, Roy T., 4,572,933, Cl. 200-151.000.
S. J. Electro Systems, Inc.: *See—*
Johnston, Stephen P., 4,572,934, Cl. 200-222.000.
S.K.F. Compagnie d'Application Mecaniques & Compagnie: *See—*
Pruvost, Bernard, 4,571,811, Cl. 29-436.000.
Sabourin, Edward T.: *See—*
Onopchenko, Anatoli; and Sabourin, Edward T., 4,572,791, Cl. 252-46.300.
Sachenik, Paul A.: *See—*
Bellman, Robert H.; Borrelli, Nicholas F.; Morse, David L.; and Sachenik, Paul A., 4,572,611, Cl. 350-167.000.
Sagalowsky, Ronald L., to Biorem, Inc. Penile tumescence monitor. 4,572,211, Cl. 128-774.000.
Sagefors, Ivar K., to Boliden Aktiebolag. Method in the excavation of underground caverns in rock. 4,572,707, Cl. 405-55.000.
Sahara, Hiroaki: *See—*
Uemura, Noboru; Sahara, Hiroaki; and Hirayama, Yasunori, 4,571,885, Cl. 49-177.000.
Saigo, Tsuyoshi; and Kitani, Akira, to Hoya Lens Corporation. Method for determining optimum thickness of ophthalmic lens. 4,573,121, Cl. 364-413.000.
Saimoto, Shigeo; and Basinski, Zbigniew, to Queen's University at Kingston. Method and apparatus for measuring thermodynamic response. 4,572,001, Cl. 73-765.000.
St. Mary Manufacturing Corp.: *See—*
Kluczynski, Paul F., 4,572,014, Cl. 74-89.150.
St. Onge, Kenneth J., to Halliburton Company. Cementing system including real time display. 4,571,993, Cl. 73-151.000.
Saito, Eiichi: *See—*
Takahashi, Michihiko; Saito, Eiichi; and Okano, Takeshi, 4,572,649, Cl. 355-3.00R.
Saito, Hiroshi; Okayasu, Hiromasa; Tsuyuki, Shinichi; Kawana, Takeshi; Mifune, Takao; and Yoshizaki, Masanori, to Hitachi, Ltd. Apparatus for inserting coils into stator core slots. 4,571,822, Cl. 29-736.000.
Saito, Ikuo: *See—*
Ueda, Yoshihiko; Saito, Ikuo; Sakae, Kazumasa; and Oogiri, Tetuo, 4,572,082, Cl. 110-245.000.
Saito, Ken. Dump apparatus. 4,572,579, Cl. 298-1.00A.
Saito, Masayuki; Suzuki, Haruko; and Oodaira, Hirosi, to Kabushiki Kaisha Toshiba. Method for producing a capacitor with precise capacitance. 4,572,843, Cl. 427-53.100.
Saito, Takashi: *See—*
Sugiyama, Hiroyuki; Sakurai, Masaki; Abe, Ryozo; Yusa, Yasuhiro; Yoshihara, Kenji; and Saito, Takashi, 4,573,092, Cl. 360-97.000.
Saitoh, Keishi; Ohnuki, Yukihiko; and Ohno, Shigeru, to Canon Kabushiki Kaisha. Photoconductive member containing amorphous silicon and germanium. 4,572,882, Cl. 430-57.000.
Saitoh, Mitsunori: *See—*
Sakuragi, Shiro; Saitoh, Mitsunori; Kotani, Haruo; and Imagawa, Kyoshiro, 4,572,609, Cl. 350-96.300.
Sakae, Kazumasa: *See—*
Ueda, Yoshihiko; Saito, Ikuo; Sakae, Kazumasa; and Oogiri, Tetuo, 4,572,082, Cl. 110-245.000.
Sakagami, Teruo; and Arakawa, Noriyuki, to Kureha Kagaku Kogyo Kabushiki Kaisha. Substrate for analyzing hydrophilic substances of low molecular weight. 4,572,905, Cl. 502-402.000.
Sakai, Hideo: *See—*
Arita, Kishio; Mitani, Susumu; Sakai, Hideo; Sudo, Yoshikazu; Koide, Yoshitaka; Sato, Haruzi; Habuka, Yoshio; Kozakai, Takashi; and Tanaka, Hiroji, 4,571,999, Cl. 73-598.000.
Sakai, Kazuo; Matsushima, Yuichi; Akiba, Shigeyuki; and Utaka, Katsuyuki, to Kokusai Denshin Denwa Kabushiki Kaisha. Semiconductor laser. 4,573,161, Cl. 372-45.000.
Sakai, Kazuo: *See—*
Utaka, Katsuyuki; Sakai, Kazuo; and Akiba, Shigeyuki, 4,573,158, Cl. 372-32.000.
Sakai, Tetsuro; and Honda, Kazuhiko, to Tokyo Shibaura Denki Kabushiki Kaisha. Color television signal converting circuit. 4,573,086, Cl. 358-11.000.
Sakakibara, Susumu: *See—*
Yuge, Shizuo; Oka, Tateki; Sakakibara, Susumu; and Toyoshi, Naoki, 4,572,102, Cl. 118-689.000.
Sakakibara, Yasuyuki: *See—*
Takeuchi, Yasuhiro; Sakakibara, Yasuyuki; and Watanabe, Kazuhide, 4,572,136, Cl. 123-447.000.
Sakamoto, Keiji: *See—*
Kurakake, Mitsuo; and Sakamoto, Keiji, 4,573,002, Cl. 318-721.000.
Sakamoto, Takashi, to Dainippon Screen Mfg. Co., Ltd. Method and system for displaying a color image simulating a multi-color printed matter on a screen. 4,573,071, Cl. 358-76.000.
Sakazaki Machinery Works Co., Ltd.: *See—*
Fukuoka, Masayuki; and Matsumoto, Satoshi, 4,571,813, Cl. 29-568.000.
Sakemi, Yuji: *See—*
Fujii, Haruo; Sakemi, Yuji; and Toyono, Tsutomu, 4,573,061, Cl. 346-153.100.

Sakuragi, Shiro; Saitoh, Mitsunori; Kotani, Haruo; and Imagawa, Kyoshiro, to Agency of Industrial Science & Technology. Cooling mechanism for optical fiber. 4,572,609, Cl. 350-96.300.

Sakurai, Masaki: *See*—
Sugiyama, Hiroyuki; Sakurai, Masaki; Abe, Ryozo; Yusa, Yasuhiro; Yoshihara, Kenji; and Saito, Takashi, 4,573,092, Cl. 360-97.000.

Sakurai, Shigeru, to Mazda Motor Corporation. Exhaust gas cleaning device for diesel engines. 4,571,938, Cl. 60-303.000.

Sakurai, Tomonari: *See*—
Furuya, Katusuke; and Sakurai, Tomonari, 4,572,349, Cl. 194-318.000.

Sakurai, Yoshimi; and Miyake, Junichi, to Honda Giken Kogyo Kabushiki Kaisha. Automatic transmission control system for vehicle. 4,572,030, Cl. 74-866.000.

Salem, Eli: *See*—
Kunin, Robert; and Salem, Eli, 4,572,742, Cl. 127-46.200.

Salomon, George P. J., to Salomon S.A. Safety binding for a ski. 4,572,539, Cl. 280-611.000.

Salomon S.A.: *See*—
Blanc, Roger, 4,571,855, Cl. 36-50.000.
Salomon, George P. J., 4,572,539, Cl. 280-611.000.

Salvat, Francois: *See*—
Bouko, Jean; Durand, Jean-Claude; Le Foll, Jean; and Salvat, Francois, 4,573,054, Cl. 343-786.000.

Samuelsson, Frank A., to United Air Lines, Inc. Apparatus for vertically lifting and radially moving a person over a supporting surface. 4,571,758, Cl. 5-86.000.

Sanborn, Harold C.; Carago, Frank; and Kreeger, John R., to United Technologies Corporation. Refractory metal coated metal-working dies. 4,571,983, Cl. 72-462.000.

Sanden Corporation: *See*—
Hukuhara, Seiichi, 4,572,276, Cl. 164-342.000.

Sanders, Peter G., to Rotork Controls Limited. Actuating mechanism. 4,572,932, Cl. 200-17.00R.

Sando Iron Works Co., Ltd.: *See*—
Sando, Yoshikazu; and Ishidoshiro, Hiroshi, 4,571,962, Cl. 68-5.00E.

Sando, Yoshikazu; and Ishidoshiro, Hiroshi, to Sando Iron Works Co., Ltd. Apparatus for continuous liquid treatment of a cloth. 4,571,962, Cl. 68-5.00E.

Sandoz Ltd.: *See*—
Danner, Bernard, 4,572,721, Cl. 8-94.10R.

Sangati, Guido, to Sangati S.p.A. Pneumatic control system for grinding mill. 4,572,441, Cl. 241-34.000.

Sangati S.p.A.: *See*—
Sangati, Guido, 4,572,441, Cl. 241-34.000.

Sango Jyuki Kabushiki Kaisha: *See*—
Kanno, Samon; Kaneko, Naotomo; and Kozaki, Takaharu, 4,571,968, Cl. 72-331.000.

Sankyo Company Limited: *See*—
Yoshioka, Takao; Kitazawa, Eiici; Kurumada, Tomoyuki; Yamazaki, Mitsuo; and Hasegawa, Kazou, 4,572,912, Cl. 514-369.000.

Sano, Shigehisa: *See*—
Umezawa, Yujiro; Sano, Shigehisa; and Ogino, Takao, 4,572,264, Cl. 152-451.000.

Sanshin Kogyo Kabushiki Kaisha: *See*—
Matsumoto, Kuniyoshi, 4,572,120, Cl. 123-196.00S.

Sansin Kiko Co. Ltd.: *See*—
Kawakita, Mayuto, 4,572,492, Cl. 269-75.000.

Santrade Limited: *See*—
Tunell, Lars-Erik, 4,572,307, Cl. 175-410.000.
Wiman, Jorgen V., 4,572,042, Cl. 82-1.00C.

Sanvido, Saverio: *See*—
Arndt, Klaus; and Sanvido, Saverio, 4,572,625, Cl. 350-541.000.

Sanyo Electric Co., Ltd.: *See*—
Morioka, Yuji, 4,572,879, Cl. 429-94.000.

Saphirwerk Industrieprodukte AG: *See*—
Funke, Herbert, 4,572,056, Cl. 92-86.000.

Saquet, Jean-Jacques. Packaging safety means for syphon type powder dispensers. 4,572,407, Cl. 222-83.000.

Sasaki, Hiroshi: *See*—
Nakashima, Waichiro; Sasaki, Hiroshi; and Nishizaki, Katsuhiro, 4,572,271, Cl. 164-97.000.

Sasaki, Masaomi, to Ricoh Company, Ltd. Stilbene derivatives and electrophotographic photoconductor comprising one stilbene derivative. 4,572,884, Cl. 430-72.000.

Sasaki, Noboru; Mukai, Teruo; and Iwata, Yasuji, to France Bed Co., Ltd. Bed apparatus with a urinal. 4,571,759, Cl. 5-90.000.

Sasaki, Susumu: *See*—
Nakamura, Hiroshi; Fukuda, Eisuke; and Sasaki, Susumu, 4,573,153, Cl. 371-22.000.

Saska, Thomas J.: *See*—
Driggers, John M.; Saska, Thomas J.; and Kitzes, Arnold S., 4,572,938, Cl. 219-85.0BM.

Satake Engineering Co., Ltd.: *See*—
Satake, Toshihiko, 4,572,666, Cl. 356-239.000.

Satake, Toshihiko, to Satake Engineering Co., Ltd. Apparatus for detecting cracked rice grain. 4,572,666, Cl. 356-239.000.

Satake, Toshimi; Minami, Toshiaki; Fujimura, Fumio; Oda, Satoshi; and Magami, Masato, to Jujo Paper Co., Ltd.; and Yoshitomi-Pharmaceutical Ind., Ltd. Thermosensitive recording sheet. 4,573,062, Cl. 346-209.000.

Sato, Haruzi: *See*—
Arita, Kishio; Mitani, Susumu; Sakai, Hideo; Sudo, Yoshikazu; Koide, Yoshitaka; Sato, Haruzi; Habuka, Yoshio; Kozakai, Takashi; and Tanaka, Hiroji, 4,571,999, Cl. 73-598.000.

Sato, Keiji; Kasuya, Takahira; Yamakawa, Goichi; and Wada, Tsuneo, to Konishiroku Photo Industry Co., Ltd. Developer composition for developing an electrostatic image. 4,572,885, Cl. 430-99.000.

Sato, Kimio: *See*—
Iwayama, Kazuyoshi; Inoue, Takehisa; Sato, Kimio; Hayakawa, Norio; and Fujii, Masaki, 4,572,779, Cl. 208-111.000.

Sato, Nobuhiro; Katsura, Yuji; and Ueno, Haruyuki, to Kurosaki Refractories Co., Ltd. Method for producing silicon nitride sintered body of complex shape. 4,572,828, Cl. 423-344.000.

Sato, Tadao; and Shimazaki, Yoshikazu, to Fuji Kagakushi Kogyo Co., Ltd. Heat-sensitive color transfer ribbon. 4,572,684, Cl. 400-240.400.

Sato, Yasuaki: *See*—
Amano, Tadashi; Sato, Yasuaki; and Ohkoshi, Yasuo, 4,572,657, Cl. 355-38.000.

Sato, Yutaka: *See*—
Uemura, Michio; Sato, Yutaka; Nakamura, Masaru; and Iida, Toyoshi, 4,572,789, Cl. 252-8.50A.

Sattler, Hans-Peter: *See*—
Poetzschke, Manfred; and Sattler, Hans-Peter, 4,572,735, Cl. 75-10.00R.

Sauber, Charles J. Positive drive positioning collar. 4,572,692, Cl. 403-16.000.

Sauer, Roland: *See*—
Katzer, Johann; Lopic, Franz; Sauer, Roland; and Stephany, Christian, 4,572,235, Cl. 137-268.000.

Saunders, Edward A.: *See*—
Leale, Luis; Saunders, Edward A.; and Keil, Enrique, 4,572,990, Cl. 315-220.000.

Savanuck, Daniel F., to Chemical Specialties Manufacturing Corporation. Gripping composition dispenser and gripping composition therefor. 4,572,690, Cl. 401-200.000.

Sawusch, Axel W.; and Pinkerneil, Gunther. Device for the automatic supplying of fish to fish processing machines. 4,571,778, Cl. 17-54.000.

Sayegh, Georges: *See*—
Sciaky, Mario; Cazes, Roland; and Sayegh, Georges, 4,572,941, Cl. 219-121.0LD.

Scarlett, John A., to Standard Telephones and Cables Public Limited Company. Printed circuit boards with solderable plating finishes and method of making the same. 4,572,925, Cl. 174-68.500.

Schaffer, Harry G.: *See*—
Greene, Richard E.; Young, Gladstone F.; Tom, Gary E.; Schaffer, Harry G.; and Foote, John S., 4,573,152, Cl. 371-22.000.

Schaper, Klaus: *See*—
Hentschke, Siegbert; and Schaper, Klaus, 4,573,167, Cl. 375-27.000.

Schatz, Klaus W.: *See*—
Owen, Hartley; and Schatz, Klaus W., 4,572,780, Cl. 208-161.000.

Schaudt Maschinenbau GmbH: *See*—
Brill, Jurgen, 4,571,892, Cl. 51-325.000.

Scheidegger, Christian: *See*—
Franz, Reinhard; Dittmar, Wilfried; Scheidegger, Christian; and Frohlich, Roland, 4,572,048, Cl. 84-1.190.

Scherer, Michael: *See*—
Dietrich, Anton; Hartig, Klaus; and Scherer, Michael, 4,572,842, Cl. 427-39.000.

Schetrumpf, John R. Abrasion device. 4,572,187, Cl. 128-355.000.

Schiel, Lothar, to ITT Industries, Inc. Vacuum power brake booster. 4,572,055, Cl. 91-369.00A.

Schindl, Klaus, to C. Reichert Optische Werke, AG. Drafting and macrophotography attachment for a microscope of the inverted type. 4,572,624, Cl. 350-502.000.

Schlapp, Werner; and Wiessner, Willi, to Ernst Leitz Wetzlar GmbH. Photographic objective with a fastening device. 4,572,612, Cl. 350-257.000.

Schleich, Jean-Baptiste; Lahoda, Erwin; Lickes, Jean-Paul; and Reuter, Emile, to Arbed S.A. Prefabricated fireproof steel and concrete beam. 4,571,913, Cl. 52-722.000.

Schlick, Horst: *See*—
Vogler, Hans-Ulrich; Ruschek, Gerhard; and Schlick, Horst, 4,572,478, Cl. 251-305.000.

Schluter, Wilhelm, to Gebruder Lodige Maschinenbau-Gesellschaft mbH. Apparatus for moistening loose material. 4,572,100, Cl. 118-303.000.

Schmid, Gunther: *See*—
Grunwald, Werner; Imhof, Ernst; Komaroff, Iwan; Mayer, Rolf; and Schmid, Gunther, 4,572,146, Cl. 123-549.000.

Schmidhauser, Markus: *See*—
Huber, Willi; and Schmidhauser, Markus, 4,572,437, Cl. 239-703.000.

Schmidt, Erhard: *See*—
Deutschmann, Herbert; Schmidt, Erhard; and Wolters, Gerd-Michael, 4,572,148, Cl. 123-559.000.

Schmidt, Erik, to Seco Tools AB. Cutting insert for thread cutting. 4,572,713, Cl. 407-114.000.

Schneider, Gottfried: *See*—
Wegner, Christian; Schneider, Gottfried; and Mayer, Wolfram, 4,572,171, Cl. 128-90.000.

Schneider, Robert: *See*—
Engelberg, Franz; Fabris, Luciano; Schneider, Robert; Villinger, Gerhard; and Truninger, Walter, 4,572,485, Cl. 266-227.000.

Schneider, Theodor: *See*—
Haar, Gerhard; Jakob, Heinz; Prohaska, Hans; Schneider, Theodor; Schubert, Karl-Friedrich; and Wohrle, Werner, 4,572,979, Cl. 310-68.00R.

Schneider, Walter, to W. Schneider & Co. AG, Metallwarenfabrik. Box construction. 4,572,392, Cl. 220-4.00R.

Schneider, Walter: *See*—
Boden, Heinrich; and Schneider, Walter, 4,572,820, Cl. 422-133.000.

Schoffmann, Franz: *See*—
Traumumiller, Gottfried; Maier, Wilfried; Schoffmann, Franz; and Wrulich, Herwig, 4,572,583, Cl. 299-81.000.

Schofield, Charles P.; and Wilkin, Arthur L., to National Research Development Corporation. Trailer coupling device. 4,572,538, Cl. 280-478.00R.

Scholz, Dieter: *See*—
Kretzschmann, Gunther; Scholz, Dieter; and Hilgert, Karl-Heinz, 4,572,740, Cl. 106-122.000.

Scholz, Erhard; Heimann, Edmund; and Baach, Hans, to Schweissindustrie Oerlikon Buhrle AG. Submerged arc welding process. 4,572,936, Cl. 219-73.200.

Schorman, Eric: *See*—
Smith, Paul F.; Schorman, Eric; Burke, Tim; and Lynk, Chuck, 4,573,207, Cl. 455-54.000.

Schouhamer Immink, Kornelis A., to U.S. Philips Corporation. Method of encoding n-bit information words into m-bit code words, apparatus for carrying out said method, method of decoding m-bit code words into n-bit information words, and apparatus for carrying out said method. 4,573,034, Cl. 340-347.0DD.

Schreiber, Friedrich: *See*—
Kassner, Jochen; and Schreiber, Friedrich, 4,571,830, Cl. 30-200.000.

Schrenk, Hartmut, to Siemens Aktiengesellschaft. Credit card circuit arrangement with a memory and an access control unit. 4,572,946, Cl. 235-380.000.

Schrepfer, Rudolf, to Rudolph Schrepfer AG. Spring-equipped mechanical vibration damper. 4,572,471, Cl. 248-560.000.

Schroeder, Eugene; and Fry, Francis J., to Indianapolis Center for Advanced Research. Intraoperative scanner. 4,572,200, Cl. 128-660.000.

Schubert, Karl-Friedrich: *See*—
Haar, Gerhard; Jakob, Heinz; Prohaska, Hans; Schneider, Theodor; Schubert, Karl-Friedrich; and Wohrle, Werner, 4,572,979, Cl. 310-68.00R.

Schubert, Rudolf, to AT&T Bell Laboratories. Sealed relay structure. 4,573,030, Cl. 335-156.000.

Schuch, Andre: *See*—
Le Cacheux, Paul; Schuch, Andre; and Perrot, Alain C., 4,571,898, Cl. 52-36.000.

Schulte-Schlagbaum Aktiengesellschaft: *See*—
Eisermann, Armin, 4,572,347, Cl. 194-205.000.
Eisermann, Armin; ten Eicken, Heinz; Obenluneschloss, Kurt; and Geiger, Diethard, 4,572,348, Cl. 194-248.000.

Schultz, William R., Jr.: *See*—
Anderson, James M.; Schultz, William R., Jr.; VanSchaick, Thomas E.; and Anderson, Frank E., Jr., 4,572,980, Cl. 310-214.000.

Schupbach, Walter. Stereophonic baffle. 4,572,325, Cl. 181-145.000.

Schurger, Rainer: *See*—
Neder, Gunter; and Schurger, Rainer, 4,572,678, Cl. 384-533.000.

Schwab, Manfred F., to Alfred Honsel Nieten- und Metallwarenfabrik GmbH & Co. Blind riveting apparatus for rivets of different sizes. 4,571,976, Cl. 72-391.000.

Schwab, Michael: *See*—
Lang, Winfried; Griesshammer, Rudolf; Schwab, Michael; and Zulehner, Werner, 4,572,729, Cl. 65-18.100.

Schwartz, C. Bruce. Arthroscopy support stand. 4,572,594, Cl. 312-209.000.

Schwarzbeck, Erich, to Hiedelberger Druckmaschinen AG. Device for changing a numbering and imprinting device in a printing press. 4,572,069, Cl. 101-76.000.

Schweissindustrie Oerlikon Buhrle AG: *See*—
Scholz, Erhard; Heimann, Edmund; and Baach, Hans, 4,572,936, Cl. 219-73.200.

Schweitzer, Ronald D., to Tappan Company, The. Gas range. 4,572,154, Cl. 126-39.00E.

Schwelm, Hans, to Barmag Barmer Maschinenfabrik AG. Hydraulic flow control valve. 4,572,234, Cl. 137-489.000.

Sciaky, Mario; Cazes, Roland; and Sayegh, Georges, to Sciaky, S.A. Method of and installation for spot-welding by laser beam. 4,572,941, Cl. 219-121.0LD.

Sciaky, S.A.: *See*—
Sciaky, Mario; Cazes, Roland; and Sayegh, Georges, 4,572,941, Cl. 219-121.0LD.

Scott, David W.: *See*—
Bishop, Arthur E.; Roeske, Klaus J.; and Scott, David W., 4,571,982, Cl. 72-400.000.

Scott, Philip R.: *See*—
Wakely, Wilbur T.; and Scott, Philip R., 4,572,924, Cl. 174-52.0FP.

Scott USA Limited Partnership: *See*—
Carroll, John E.; and McNeal, Joseph R., 4,571,748, Cl. 2-436.000.

Scully, John W., to Pneumatic Scale Corporation. Apparatus for forming, filling and depositing filled bags into cartons. 4,571,926, Cl. 53-525.000.

Seachem, a division of Pittway Corp.: *See*—
Pratt, David C.; and Albanese, James J., Jr., 4,572,406, Cl. 222-39.000.

Sebb, Werner; and Dammann, Heinrich, to Peroxide-Chemie GmbH. Process for bleaching natural chalk. 4,572,825, Cl. 423-173.000.

Seco Tools AB: *See*—
Schmidt, Erik, 4,572,713, Cl. 407-114.000.

Seefeld, Dean E., to Gehl Company. Forage blower having power transmission and mounting arrangement therefor. 4,572,712, Cl. 406-101.000.

Seeley, Frederic F. Pump arrangement. 4,572,808, Cl. 261-29.000.

Seely, James R., to Marketing Displays, Inc. Deflectable sign and stand. 4,572,473, Cl. 248-624.000.

Segers, Dennis L.: *See*—
Graham, Andrew C.; Proebsting, Robert J.; and Segers, Dennis L., 4,573,146, Cl. 365-200.000.

Seghetti, Leland L.: *See*—
Phlipot, James R.; Pinkston, Steve R.; and Seghetti, Leland L., 4,572,477, Cl. 251-285.000.

Sehgal, Tyag R., to General Electric Company. Vibration damped probe. 4,572,677, Cl. 374-144.000.

Seidl, Rudolph: *See*—
Breakey, Fred B.; Barber, Leo D.; Chapman, Richard L.; Godin, Norman; Henry, Robert; Jackson, Claude; Romberger, John; and Seidl, Rudolph, 4,572,381, Cl. 211-94.000.

Seiferling, James E., to Blackwelders. Height control for agricultural machine. 4,573,124, Cl. 364-424.000.

Seifert, Kurt, to Robert Bosch GmbH. Fuel injection nozzle for internal combustion engines. 4,572,434, Cl. 239-453.000.

Seikosha Co., Ltd.: *See*—
Hayashi, Mikio, 4,572,683, Cl. 400-208.000.

Seiner, Jerome A.: *See*—
Wismer, Marco; and Seiner, Jerome A., 4,572,869, Cl. 428-402.240.

Seino, Minoru: *See*—
Matsumoto, Yoshikane; Kobayashi, Tsuneki; Kurosawa, Makoto; and Seino, Minoru, 4,572,685, Cl. 400-320.000.

Seki, Fumio, to Nippon Notion Kogyo Co., Ltd. Apparatus for assembling buttons. 4,571,806, Cl. 29-251.000.

Seki, Teruo: *See*—
Aoyama, Keizo; Yamauchi, Takahiko; and Seki, Teruo, 4,573,147, Cl. 365-230.000.

Sekiguchi, Kyoji: *See*—
Madate, Haruhisa; Matsumura, Isao; and Sekiguchi, Kyoji, 4,572,627, Cl. 351-206.000.

Selenia S.p.A.: *See*—
Farina, Alfonso, 4,573,051, Cl. 343-18.00E.

Selfridge, Glenn D.; and Tipton, Russell C., to Mallinckrodt, Inc. Controlled atmosphere enclosure. 4,572,427, Cl. 236-3.000.

Sellner, Jorg; Siegwart, Rudolf; and Grauli, Siegfried, to Voest-Alpine Aktiengesellschaft. Lathe. 4,571,796, Cl. 29-27.00R.

Senmed, Inc.: *See*—
Juska, Donald D., 4,572,183, Cl. 128-325.000.

Sensormatic Electronics Corporation: *See*—
Boyd, Robert C.; and La Patra, Charles L., 4,573,042, Cl. 340-539.000.

Seo, Nobuhide: *See*—
Yokooku, Katsuhiko; Seo, Nobuhide; Oda, Hiroyuki; and Yatomi, Satoshi, 4,572,031, Cl. 74-866.000.

Sepp, Walter E.: *See*—
Dorsey, Denis P.; Sepp, Walter E.; and Pritchard, Dalton H., 4,573,068, Cl. 358-11.000.

Sergeant, Ronald G.: *See*—
Pegram, Warren J.; and Sergeant, Ronald G., 4,572,248, Cl. 140-92.100.

Seto, Toru: *See*—
Hino, Masao; Honda, Mitsuyasu; and Seto, Toru, 4,572,903, Cl. 502-55.000.

Severson, Gerald R.: *See*—
Foss, Robert M.; and Severson, Gerald R., 4,572,846, Cl. 427-237.000.

Sewell Plastics, Inc.: *See*—
Hunter, Burnis L., 4,572,355, Cl. 198-803.120.

Shadduck, Laurine R. Food chopper. 4,572,444, Cl. 241-168.000.

Shallenberger, John M.: *See*—
Gjertsen, Robert K.; Wilson, John F.; and Shallenberger, John M., 4,572,816, Cl. 376-261.000.

Sharp Kabushiki Kaisha: *See*—
Deguchi, Toshihisa; Ohta, Kenji; Takahashi, Akira; and Yamaoka, Hideyoshi, 4,573,149, Cl. 369-13.000.
Ikemoto, Yutaka, 4,573,134, Cl. 364-705.000.
Kawahara, Masafumi, 4,572,213, Cl. 128-736.000.
Okuda, Masakiyo, 4,572,650, Cl. 355-3.0SH.
Tada, Mitsuro; Ikegami, Takeshi; and Komori, Hisao, 4,572,652, Cl. 355-14.00R.

Shaw, Roy. Plant pot drain. 4,571,883, Cl. 47-66.000.

Shell Internationale Research Maatschappij B.V.: *See*—
Warren, Geoffrey F.; and Cameron, Andrew M., 4,572,736, Cl. 75-10.00R.

Shell Oil Company: *See*—
Mitchell, Forrest R., 4,572,322, Cl. 181-105.000.
Moore, George R., 4,572,826, Cl. 423-236.000.
Vanegmond, Cor F.; and Van Meurs, Peter, 4,572,299, Cl. 166-385.000.

Shepard, David H., to Cognitronics Corporation. Apparatus for extracting energy from winds at high altitudes. 4,572,962, Cl. 290-55.000.

Shepherd, Paul E.: *See*—
Guerracini, Joseph; Shepherd, Paul E.; and McQuade, Robert W., 4,572,021, Cl. 74-479.000.
Sherman, Charles F.: *See*—
Cole, Mark T.; and Sherman, Charles F., 4,571,866, Cl. 40-152.100.
Sherwood, Michael D.: *See*—
Roth, Richard W.; Gregor, William T.; Sherwood, Michael D.; and Pokrajac, Ned, 4,573,192, Cl. 382-1.000.
Shibib, Muhammed A.: *See*—
Becke, Hans W.; Gammel, John C.; Hartman, Adrian R.; Shibib, Muhammed A.; and Smith, Robert K., 4,573,065, Cl. 357-38.000.
Shiets, Leo C. Apparatus for rebuilding vehicle axles. 4,571,795, Cl. 29-26.00B.
Shigeki, Furutani: *See*—
Kanazawa, Hirotaka; Teruhiko, Takatani; Shigeki, Furutani; Chikuma, Isamu; Shimada, Satoru; and Eda, Hiroshi, 4,572,316, Cl. 180-143.000.
Shimada, Katsumi: *See*—
Ichimiya, Yoshichika; Sudo, Tsuneta; Takehisa, Turo; and Shimada, Katsumi, 4,573,120, Cl. 364-200.000.
Shimada, Satoru: *See*—
Kanazawa, Hirotaka; Teruhiko, Takatani; Shigeki, Furutani; Chikuma, Isamu; Shimada, Satoru; and Eda, Hiroshi, 4,572,316, Cl. 180-143.000.
Shimano Industrial Company Limited: *See*—
Ban, Masuo, 4,572,448, Cl. 242-84.50A.
Furomoto, Yoshiyuki, 4,572,454, Cl. 242-84.52B.
Noda, Hideo, 4,572,455, Cl. 242-84.10R.
Shimazaki, Yoshikazu: *See*—
Sato, Tadao; and Shimazaki, Yoshikazu, 4,572,684, Cl. 400-240.400.
Shimizu, Fumio; Tachikawa, Tetsuya; Ikei, Nobuhiro; Noda, Atunari; Hashimura, Etsuro; and Imagawa, Kenichi, to Otsuka Pharmaceutical Co., Ltd. Human leukemia virus-related peptides, a process for production thereof, antibodies of the peptides and a process for production of the antibodies. 4,572,800, Cl. 260-112.50R.
Shimizu, Hiroaki: *See*—
Kigasawa, Kazuo; Shimizu, Hiroaki; Hayashi, Toshihiro; Watabe, Kazuo; Tanizaki, Akira; Koyama, Osamu; Wakisaka, Kikuo; and Ogawa, Yasuaki, 4,572,832, Cl. 424-19.000.
Shimizu, Katsuichi, to Canon Kabushiki Kaisha. Image transmission system. 4,573,083, Cl. 358-257.000.
Shimizu, Keisuke: *See*—
Kobayashi, Koji; and Shimizu, Keisuke, 4,572,393, Cl. 220-270.000.
Shimizu, Masami; and Suzuki, Nobuyuki, to Canon Kabushiki Kaisha. Display device in camera finder. 4,572,646, Cl. 354-475.000.
Shimizu, Shumpei, to Tama Chemicals Co., Ltd. Method of manufacturing tetramethyl ammonium hydroxide. 4,572,769, Cl. 204-59.00R.
Shimizu, Tasuku: *See*—
Hosaka, Nobuyoshi; and Shimizu, Tasuku, 4,572,868, Cl. 428-328.000.
Shimizu, Wataru: *See*—
Toda, Jitsuo; and Shimizu, Wataru, 4,572,951, Cl. 250-231.0SE.
Shimizu, Yoichi, to Maruyama Mfg. Co., Ltd. Heald frame assembly. 4,572,242, Cl. 139-91.000.
Shimokawa, Naoki: *See*—
Nariai, Shigeru; Himeno, Yasunori; and Shimokawa, Naoki, 4,571,950, Cl. 62-89.000.
Shinada, Masatoshi, to Nippon Piston Ring Co., Ltd. Multi-component steel piston ring with rotation preventing rivet. 4,572,520, Cl. 277-140.000.
Shinma, Mitsuru; Kobayashi, Toyohiro; Mori, Masahito; Tsuboi, Shunji; and Sugita, Masaru, to Mitsubishi Denki Kabushiki Kaisha. Ink donor sheet color detecting device. 4,573,059, Cl. 346-76.0PH.
Shinozaki, Fumiaki: *See*—
Maeda, Minoru; Iwasaki, Masayuki; and Shinozaki, Fumiaki, 4,572,888, Cl. 430-288.000.
Shinozaki, Toshiaki: *See*—
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Shinton, Yvonne D.: *See*—
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Shiotsu, Osamu: *See*—
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Shiozawa, Takao, to Konishiroku Photo Industry Co., Ltd. Sheet feeder. 4,572,498, Cl. 271-34.000.
Shirai, Hitoshi: *See*—
Yoshida, Yoichi; Hashimoto, Akihiko; Suzuki, Tatsuya; Shirai, Hitoshi; Akitake, Hiroshi; and Nakazawa, Hirotsugu, 4,572,645, Cl. 354-435.000.
Shiraishi, Daiichi, to Toyota Jidosha Kabushiki Kaisha. Construction of door in motor vehicle. 4,571,886, Cl. 49-374.000.
Shiraishi, Tomio; and Ikenoue, Shinobu, to Alps Electric Co., Ltd. Rotary switch. 4,572,931, Cl. 200-11.0DA.
Shiraiwa, Michitaka: *See*—
Hasegawa, Shumpei; Shiraiwa, Michitaka; and Tsuchiya, Sadatomo, 4,572,149, Cl. 123-589.000.
Shoji, Masakazu, to AT&T Laboratories. CMOS Logic circuits with all pull-up transistors integrated in separate chip from all pull-down transistors. 4,572,972, Cl. 307-303.000.
Shokul, Anatoly A.: *See*—
Ioshpa, Vladimir G.; Kirievsky, Boris A.; Kravchenko, Anatoly P.; Kudinov, Gennady A.; Kutsykovich, Dorina B.; Lysenko, Evgeny E.; Shokul, Anatoly A.; Nekrasov, Ignaty N.; Filipiev, Oleg V.; and Lugansky, Vladimir P., 4,572,269, Cl. 164-93.000.
Sholder, Jason A.: *See*—
Mann, Brian M.; and Sholder, Jason A., 4,572,193, Cl. 128-419.0PG.
Showalter, Stephen D.: *See*—
Hampar, Berge; Zweig, Martin; and Showalter, Stephen D., 4,572,896, Cl. 435-172.200.
Shuto, Yukichi; and Miyagawa, Tamotsu, to Mitsubishi Denki Kabushiki Kaisha. Individual identification apparatus. 4,573,193, Cl. 382-2.000.
Sickler, Kenneth H., to Jacobs Manufacturing Company, The. Process and apparatus for compression release engine retarding producing two compression release events per cylinder per engine cycle. 4,572,114, Cl. 123-21.000.
Sidi, Joel: *See*—
Azam, Guy; Convert, Guy; Dufour, Jacques; Jasmin, Claude; and Sidi, Joel, 4,572,190, Cl. 128-399.000.
Sidwell, Derek, to Cameron Iron Works, Inc. Subsea pipelines. 4,572,549, Cl. 285-39.000.
Siegwart, Rudolf: *See*—
Sellner, Jorg; Siegwart, Rudolf; and Grauli, Siegfried, 4,571,796, Cl. 29-27.00R.
Siemens Aktiengesellschaft: *See*—
Frieling, Focko; and Michael, Ewald, 4,572,974, Cl. 307-475.000.
Lischke, Burkhard, 4,573,008, Cl. 324-158.00R.
Nitschke, Christoph; Wehrberger, Helmut; and Menhorn, Hermann, 4,572,929, Cl. 191-29.00R.
Schrenk, Hartmut, 4,572,946, Cl. 235-380.000.
Summ, Herbert, 4,573,180, Cl. 378-037.000.
Voigt, Ulrich; Hor, Leopold; and Stoebrich, Werner, 4,572,597, Cl. 312-257.0SK.
Wondra, Jurgen, 4,573,036, Cl. 340-347.0DA.
Siffert, David E.: *See*—
Siffert, David W., 4,572,470, Cl. 248-551.000.
Siffert, David W., to Siffert, David E. Non-removable picture frame hanger and hanging method. 4,572,470, Cl. 248-551.000.
Sigg, Hans, to Maag Gear-Wheel & Machine Company Limited. Bowl-type grinding apparatus. 4,572,442, Cl. 241-117.000.
Signal Applied Technologies Inc.: *See*—
Onal, Isik, 4,572,904, Cl. 502-333.000.
Signode Corporation: *See*—
Klaus, Artur F.; and Piecha, Gottfried, 4,572,419, Cl. 227-8.000.
Signoretto, Roberto, to Photo Engineering International s.r.l. Apparatus to handle photographic disc films. 4,571,919, Cl. 53-266.00R.
Sikanen, Pertti: *See*—
Puumalainen, Pertti; and Sikanen, Pertti, 4,572,957, Cl. 250-493.100.
Silcox, Nicholas R.: *See*—
Stafford-Mills, Jonathan V.; and Silcox, Nicholas R., 4,572,527, Cl. 280-6.100.
Silem s.r.l.: *See*—
Rasca, Luigi, 4,572,465, Cl. 248-27.100.
Silver, Gary L., to United States of America, Energy. Method for removing trace pollutants from aqueous solutions. 4,572,797, Cl. 252-631.000.
Silverblatt, Bernard L., to Westinghouse Electric Corp. Plumb nozzle for nuclear fuel assembly. 4,572,817, Cl. 376-409.000.
Silverman, Bernard B., to United States of America, Army. Wire and wire like object detection system. 4,572,662, Cl. 356-5.000.
Simeth, Claus: *See*—
Mitze, Rudolf; and Simeth, Claus, 4,572,073, Cl. 101-350.000.
Simon, Bernard: *See*—
Gervais, Pierre P.; and Simon, Bernard, 4,572,402, Cl. 220-465.000.
Simon, Francois Y., to General Electric Company. Memory interface for communicating between two storage media having incompatible data formats. 4,573,141, Cl. 364-900.000.
Simon, Richard B.: *See*—
Wolski, Adam M.; Cheng, Chintsai T.; Simon, Richard B.; and Gambhirwala, Manoj C., 4,572,768, Cl. 204-15.000.
Simpson Strong-Tie Company, Inc.: *See*—
Gilb, Tyrell T., 4,572,695, Cl. 403-232.100.
Sindlinger, Ronald E., to GTE Products Corporation. Circuit breaker with thin-walled bulb. 4,572,986, Cl. 315-74.000.
Sirotkin, Karl M. Container. 4,572,374, Cl. 206-518.000.
Sitrick, David H. Video game network. 4,572,509, Cl. 273-85.00G.
Sjoberg, Staffan: *See*—
Gronberg, Thomas; Almen, Torsten; Golman, Klaes; Mattsson, Soren; and Sjoberg, Staffan, 4,573,181, Cl. 378-45.000.
Sjonell, Goran. Method at blood pressure measurement and a blood pressure cuff for carrying out the method. 4,572,205, Cl. 128-686.000.
SKF Kugellagerfabriken GmbH: *See*—
Neder, Gunter; and Schurger, Rainer, 4,572,678, Cl. 384-533.000.
Walter, Lothar; Reith, Walter; and Winkler, Otmar, 4,572,591, Cl. 308-6.00C.
Skibsted, Eric T. M. Railroad track removing apparatus. 4,571,825, Cl. 29-823.000.
Slagley, William E., to Inland Steel Company. Blast furnace tuyere with replaceable liner. 4,572,487, Cl. 266-270.000.
Sloumb, Robert C.: *See*—
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Smagatz, Leonard J., to Felt Products Mfg. Co. Interlocking sectional gasket assembly and method of making same. 4,572,522, Cl. 277-199.000.
Smaw, Jesse, to George A. Hovanec, Jr. Casting bobber with predetermined depth setting. 4,571,874, Cl. 43-4.500.
Smith, Chadwick F.; and Johansen, Walter E., III. Electronic controller for use with a surgical laser system. 4,572,189, Cl. 128-395.000.

Smith, John H.; and Logan, Otis, to Southern AG., Inc. Loading device for granular material. 4,572,782, Cl. 209-236.000.
Smith, Paul F.; Schorman, Eric; Burke, Tim; and Lynk, Chuck, to Motorola, Inc. Queued community repeater communications system. 4,573,207, Cl. 455-54.000.
Smith, Robert K.: *See—*
Becke, Hans W.; Gammel, John C.; Hartman, Adrian R.; Shibib, Muhammed A.; and Smith, Robert K., 4,573,065, Cl. 357-38.000.
Smith, Roger L.; and Wegh, John R., to Allied Corporation. Disc brake and anti-rotational heat shield therefor. 4,572,336, Cl. 188-72.600.
Smith, Ronald J.; Garman, L. David; and Reynolds, W. Evans, to Gilbert Associates, Inc. Radioactive waste multiple container system. 4,572,372, Cl. 206-511.000.
Smith, Samuel L.: *See—*
Kepple, Larry G.; and Smith, Samuel L., 4,571,997, Cl. 73-215.000.
SMS Concast Inc.: *See—*
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SMW Schneider & Weisshaupt GmbH: *See—*
Hiestand, Karl, 4,572,524, Cl. 279-1.00C.
Snijders, Wilfred A. M.: *See—*
van Gerwen, Petrus J.; and Snijders, Wilfred A. M., 4,573,169, Cl. 375-55.000.
Snow Brand Milk Products Co., Ltd.: *See—*
Kobayashi, Koji; and Shimizu, Keisuke, 4,572,393, Cl. 220-270.000.
Societa' Impianti Elettrici Telefonici Telegrafici e. Costruzioni Edili S.p.A.: *See—*
Alciati, Fiorenzo, 4,572,490, Cl. 267-140.100.
Societe Anonyme D.B.A.: *See—*
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Societe Anonyme dite: PRESTINOX: *See—*
Bodier, Jacques; Cochard, Pierre; Merlier, Christian; and Bouquin, Edouard P., 4,572,632, Cl. 353-71.000.
Societe Francaise de Munitions: *See—*
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Societe Lyonnaise des Eaux et de l'Eclairage: *See—*
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Soderberg, John H.: *See—*
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Sodergren, Lars-Olof; and Ryytty, Conny, to RyBro Handelsbolag. Temperature stabilized solar reservoir. 4,572,159, Cl. 126-415.000.
Solari, Rodolfo B.: *See—*
Krasuk, Julio; Solari, Rodolfo B.; Aquino, Luis G.; Rodriguez, Jose V.; and Granados, Alejandro, 4,572,781, Cl. 208-309.000.
Sollak, Johann: *See—*
Vinazzer, Edith; and Sollak, Johann, 4,572,540, Cl. 280-612.000.
Solmat Systems Ltd.: *See—*
Bronicki, Lucien Y., 4,571,947, Cl. 60-641.800.
Sommerfeld, Dean R.: *See—*
Weir, Robert M.; and Sommerfeld, Dean R., 4,572,596, Cl. 312-257.00R.
Sony Corporation: *See—*
Horikawa, Kenichi; Yamamoto, Yoshinori; and Kawakami, Kenji, 4,572,461, Cl. 242-198.000.
Obama, Yoshiaki; and Asami, Shojiro, 4,573,093, Cl. 360-97.000.
Suzuki, Tadao; and Abe, Miki, 4,573,039, Cl. 340-347.0DA.
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Sooki-Toth, Gabor; Horvath, Pal; Jedlovszky, Palne ; Keszler, Jozsef; and Sors, Laszlo , to Villamosipari Kutato Intezet. Method for the production of positive active material for lead storage batteries. 4,572,793, Cl. 252-182.100.
Sorli, Duncan C.: *See—*
Livingston, James J.; and Sorli, Duncan C., 4,572,634, Cl. 354-84.000.
Sors, Laszlo : *See—*
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Sosa, Hector M. Storage receptacle. 4,572,400, Cl. 220-323.000.
Sosnowski, Joseph A.; Black, Gary; and Pritchard, Robert J., to Teleflex Incorporated. Ordnance ejector system. 4,572,053, Cl. 89-1.510.
Soudronic AG: *See—*
Opprecht, Paul; and Weil, Wolfgang, 4,572,937, Cl. 219-83.000.
Sourisseaux, Ludwig: *See—*
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Southern AG., Inc.: *See—*
Smith, John H.; and Logan, Otis, 4,572,782, Cl. 209-236.000.
Southern Railway Company: *See—*
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Southern Tool Company: *See—*
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Space Age Plastic Inc.: *See—*
Ceresko, Joseph P., 4,571,791, Cl. 27-19.000.
Spadafora, Vincent A., to Jade Corporation, The. Method of making a microcircuit substrate. 4,572,757, Cl. 156-252.000.
Spangler, William F.: *See—*
Beckerer, Frank S., Jr.; and Spangler, William F., 4,572,266, Cl. 160-92.000.
Spargo, John D.; Neild, A. Bayne; and Phillips, Martha M., to United States of America, Navy. Leak free floating packing shaft seal. 4,572,518, Cl. 277-75.000.
Sparkes, Brian G.; and Murray, Douglas G., to Canada, Her Majesty the Queen in right of, as represented by the Minister of National Defence of Her Majesty's Canadian Government. Chitosan based wound dressing materials. 4,572,906, Cl. 514-21.000.
Specht, Gerhard: *See—*
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Spector, George: *See—*
Janssen, Owen R.; and Spector, George, 4,572,554, Cl. 289-17.000.
Williams, Gery R.; and Spector, George, 4,572,226, Cl. 135-22.000.
Spectrum Ceramics, Inc.: *See—*
Wakely, Wilbur T.; and Scott, Philip R., 4,572,924, Cl. 174-52.0FP.
Speich, Francisco, to Textilma AG. Single heddle control device for a weaving machine having a shedding apparatus. 4,572,247, Cl. 139-455.000.
Spencer, Aaron. Take-out box with cup and lid retainer. 4,572,423, Cl. 229-28.00R.
Spencer, Billie M.: *See—*
Currie, Robert J.; Spencer, Billie M.; Zscheile, John W., Jr.; and Rattlingourd, Glen D., 4,573,155, Cl. 371-37.000.
Sperry Corporation: *See—*
Currie, Robert J.; Spencer, Billie M.; Zscheile, John W., Jr.; and Rattlingourd, Glen D., 4,573,155, Cl. 371-37.000.
Henze, Christopher P.; and Grimm, David F., 4,573,168, Cl. 375-36.000.
Maben, Duane K., 4,572,250, Cl. 140-105.000.
Spielbrink, Heinrich: *See—*
Muller, Dieter J.; and Spielbrink, Heinrich, 4,572,743, Cl. 134-3.000.
Sprecker, Mark A.: *See—*
van Loveren, Augustinus G.; Sprecker, Mark A.; Whelan, Patrick; and Hanna, Marie R., 4,572,796, Cl. 252-522.00R.
Spurrier, Francis R., to Westinghouse Electric Corp. Apparatus for supplying electrolyte to fuel cell stacks. 4,572,876, Cl. 429-34.000.
Square D Company: *See—*
Wolski, Adam M.; Cheng, Chintsai T.; Simon, Richard B.; and Gambhirwala, Manoj C., 4,572,768, Cl. 204-15.000.
Staat, Karl-Hans: *See—*
Moltner, Hermann; and Staat, Karl-Hans, 4,571,970, Cl. 72-68.000.
Stafford, Donald C.: *See—*
Allo, Vincent F.; and Stafford, Donald C., 4,572,287, Cl. 165-118.000.
Stafford-Mills, Jonathan V.; and Silcox, Nicholas R. Apparatus for automatically levelling a base. 4,572,527, Cl. 280-6.100.
Stahlecker, Fritz; and Stahlecker, Hans, to Stahlecker, Hans; and Stahlecker, Fritz. Friction spinning roller arrangement. 4,571,932, Cl. 57-401.000.
Stahlecker, Fritz, to Hans and Fritz Stahlecker. Open-end friction spinning machine having a plurality of spinning units. 4,571,933, Cl. 57-401.000.
Stahlecker, Hans: *See—*
Stahlecker, Fritz; and Stahlecker, Hans, 4,571,932, Cl. 57-401.000.
Stand, Mille: *See—*
Eilender, Kasriel; and Stand, Mille, 4,572,174, Cl. 128-149.000.
Standard Oil Company (Indiana): *See—*
Halgrimson, Edwin A., 4,573,115, Cl. 364-138.000.
Peck, Lawrence B., 4,572,777, Cl. 208-11.0LE.
Standard Oil Company (now Amoco Corporation): *See—*
Wilson, James G.; and Crawford, Gerald J., 4,572,293, Cl. 166-250.000.
Standard Telephones and Cables Public Limited Company: *See—*
Scarlett, John A., 4,572,925, Cl. 174-68.500.
Standardwerk Eugen Reis GmbH: *See—*
Petri, Bernd; and Riffel, Jurgen, 4,572,225, Cl. 133-8.00E.
Stapp, Paul R., to Phillips Petroleum Company. Enhanced oil recovery. 4,572,292, Cl. 166-274.000.
Starkie, Alan H.: *See—*
Robinton, Michael A.; and Starkie, Alan H., 4,573,037, Cl. 340-347.0NT.
Ste LOOK: *See—*
Bernard, Jean; Beyl, Jean; le Faou, Daniel; Peyre, Henri; and Viodet, Patrice, 4,572,541, Cl. 280-628.000.
Steel Heddle Manufacturing Co.: *See—*
Kramer, Charles F., 4,572,241, Cl. 139-52.000.
Steffen, Remy. Method and apparatus for the preparation of a sausage casing package. 4,571,922, Cl. 53-397.000.
Stegner, Kevin. In-ground tank measuring system. 4,571,998, Cl. 73-321.000.
Stein, Carl; and Lewis, Harold M., to Marathon Manufacturing Company. Venetian blind with selective tilt limiting. 4,572,267, Cl. 160-176.00R.
Stenlund, Stig, to Hep Products AB. Automatic adjusting valve for controlling fluid flow. 4,572,238, Cl. 137-625.300.
Stephany, Christian: *See—*
Katzer, Johann; Lopic, Franz; Sauer, Roland; and Stephany, Christian, 4,572,235, Cl. 137-268.000.
Stephens, Thomas P., to Hewlett-Packard Company. Pressure dome with compliant chamber. 4,572,204, Cl. 128-675.000.
Sterner, David. Direct opposite reverse refractor. 4,572,622, Cl. 350-432.000.
Stettner, Ernest R.; Cianfichi, Kenneth P.; and Stoltman, Donald D., to General Motors Corporation. Electromagnetic fuel injector with tapered armature/valve. 4,572,436, Cl. 239-585.000.
Stevens, John E., to Leggett & Platt, Incorporated. Frame support for sofa-sleeper. 4,571,755, Cl. 5-13.000.
Stevens, Stanley J.; and Hoffman, Jeffrey G., to General Signal Corporation. Anti-rotation locking assembly. 4,572,718, Cl. 411-107.000.

Stewart, Brian C.; and Lofgren, Michael S. Tri-supported vehicle. 4,572,535, Cl. 280-282.000.

Still, Donald O.; and Hovance, Hubert T., to Firestone Tire & Rubber Company, The. Pivot mounted cutting knife. 4,572,046, Cl. 83-171.000.

Stills, Melvin L.: *See*—
Mauldin, Donald M.; and Jones, Richard E., III, 4,572,169, Cl. 128-80.00H.

Stock, Arthur J.; Christofer, Donald E.; Homer, John C.; Torok, Robert J.; and Whittington, Thomas, to General Signal Corporation. Method and apparatus for changing filters in nuclear power stations. 4,572,710, Cl. 414-146.000.

Stock, David; and Akers, William. Steerable spotlight assembly. 4,573,107, Cl. 362-49.000.

Stoebrich, Werner: *See*—
Voigt, Ulrich; Hor, Leopold; and Stoebrich, Werner, 4,572,597, Cl. 312-257.0SK.

Stohl, Clark E.; and DeCastro, Eugene, to Blackstone Corporation. Wave guide attachment means and methods. 4,572,184, Cl. 128-328.000.

Stoltman, Donald D.: *See*—
Stettner, Ernest R.; Cianfichi, Kenneth P.; and Stoltman, Donald D., 4,572,436, Cl. 239-585.000.

Stoppazzini, Benito, to E.M.M. Emiliana Macchine Maglierie s.r.l. Automatic straight knitting machine. 4,571,955, Cl. 66-75.100.

Storage Technology Partners: *See*—
Hug, Paul; Umeda, William; Chapdelaine, Paul; and Paul, Raymond E., 4,572,421, Cl. 228-103.000.

Stoss, Johannes: *See*—
Katscher, Erich; Stoss, Johannes; Weber, Robert; Zoberlein, Dieter; Weber, Jakob; and Forster, Josef, 4,572,284, Cl. 165-95.000.

Stout, Robert L., to Clinical Reference Laboratory, Inc. Biologic and method of preparing same. 4,572,834, Cl. 424-86.000.

Stout, Wesley, III. Direct readout centerline measuring device and process. 4,571,838, Cl. 33-169.00C.

Stoyanoff, Dimiter. Self-framing structural metal riblath wall. 4,571,914, Cl. 52-747.000.

Strahan, Virgil H.: *See*—
James, Kenneth A.; Quick, William H.; and Strahan, Virgil H., 4,572,669, Cl. 356-352.000.

Strangfeld, Reiner, to Georg Rost & Sohne Armaturenfabrik GmbH & Co Kg. Toilet-tank discharge valve. 4,571,753, Cl. 4-324.000.

Strassner, Martin F. Automobile dent protection system. 4,571,903, Cl. 52-173.00R.

Strauss, H. William: *See*—
Moore, Richard H.; Strauss, H. William; and Alpert, Nathaniel M., 4,572,197, Cl. 128-644.000.

Stresswall International, Inc.: *See*—
Benson, Cade L.; and Babcock, John W., 4,572,711, Cl. 405-286.000.

Stromberg-Carlson Corp.: *See*—
Jotwani, Haresh C., 4,573,151, Cl. 370-56.000.

Stubbs, John K.: *See*—
Campbell, Simon F.; Cross, Peter E.; Stubbs, John K.; and Arrowsmith, John E., 4,572,908, Cl. 514-340.000.
Campbell, Simon F.; Cross, Peter E.; and Stubbs, John K., 4,572,909, Cl. 514-356.000.

Stumpf, Gunter O. Apparatus for laying web material. 4,572,495, Cl. 270-31.000.

Sudo, Tsuneta: *See*—
Ichimiya, Yoshichika; Sudo, Tsuneta; Takehisa, Turo; and Shimada, Katsumi, 4,573,120, Cl. 364-200.000.

Sudo, Yoshikazu: *See*—
Arita, Kishio; Mitani, Susumu; Sakai, Hideo; Sudo, Yoshikazu; Koide, Yoshitaka; Sato, Haruzi; Habuka, Yoshio; Kozakai, Takashi; and Tanaka, Hiroji, 4,571,999, Cl. 73-598.000.

Suga, Masataka; Yamada, Makoto; Takahashi, Kazuhide; Iwasaki, Nobuhiro; Matsui, Kazuyuki; Izawa, Toru; Watanabe, Itaru; and Tagawa, Hisatoshi, to Nippon Kokan Kabushiki Kaisha. Method of manufacturing high tensile strength steel plates. 4,572,748, Cl. 148-12.00F.

Suga, Tadoru, to Ibaraki Seiki Co., Ltd. Packing apparatus. 4,571,927, Cl. 53-547.000.

Sugawara, Koko: *See*—
Konishi, Masataka; Sugawara, Koko; Miyaki, Takeo; and Kawaguchi, Hiroshi, 4,572,895, Cl. 435-75.000.

Sugihara, Kazuyoshi: *See*—
Tojo, Toru; Mori, Ichiro; Shinozaki, Toshiaki; Sugihara, Kazuyoshi; Tabata, Mitsuo; and Itoh, Chikara, 4,572,956, Cl. 250-492.200.

Sugita, Hiroshi: *See*—
Ono, Satoshi; Sugita, Hiroshi; and Hiramitsu, Tetsushi, 4,572,313, Cl. 180-78.000.

Sugita, Masaru: *See*—
Shinma, Mitsuru; Kobayashi, Toyohiro; Mori, Masahito; Tsuboi, Shunji; and Sugita, Masaru, 4,573,059, Cl. 346-76.0PH.

Sugiura, Ryuzo: *See*—
Nishimura, Tomio; Kikuchi, Junzo; Sugiura, Ryuzo; and Yoshida, Toshiro, 4,572,928, Cl. 179-99.00A.

Sugiyama, Hiroyuki; Sakurai, Masaki; Abe, Ryozo; Yusa, Yasuhiro; Yoshihara, Kenji; and Saito, Takashi, to Victor Company of Japan, Ltd. Rotary recording medium reproducing apparatus. 4,573,092, Cl. 360-97.000.

Sulzer Brothers Limited: *See*—
Gachsay, Lorant, 4,572,245, Cl. 139-291.00C.

Sumitomo Wall Systems, Ltd.: *See*—
Uemura, Noboru; Sahara, Hiroaki; and Hirayama, Yasunori, 4,571,885, Cl. 49-177.000.

Summ, Herbert, to Siemens Aktiengesellschaft. X-Ray diagnostic apparatus with a compression carriage. 4,573,180, Cl. 378-037.000.

Sumter Casket Company: *See*—
James, Jasper T., III, 4,571,790, Cl. 27-10.000.

Sunbeam Plastics Corporation: *See*—
Gach, Peter P., 4,572,389, Cl. 215-253.000.
Luker, Edward, 4,572,385, Cl. 215-216.000.
Luker, Edward; and Wright, David M., 4,572,387, Cl. 215-252.000.
Luker, Edward; and Wright, David M., 4,572,388, Cl. 215-252.000.

Sundberg, Yngve, to ASEA Aktiebolag. Method for centrifugal casting. 4,572,278, Cl. 164-457.000.

Superros Dammann-Luxol A/S, Frydenlundsvej: *See*—
Moller, Jens Gert K., 4,572,703, Cl. 404-94.000.

Sussman, Richard C.; and Evans, Larry G., to Armco Inc. Method of producing boron alloy. 4,572,747, Cl. 148-3.000.

Sutera, Richard; Burchett, Roger C.; and Dukes, Janet L., to Burlington Industries, Inc. Continuous ink jet auxiliary droplet catcher and method. 4,573,057, Cl. 346-1.100.

Suzuki, Atsushi: *See*—
Abe, Tomoaki; Kinugawa, Masumi; and Suzuki, Atsushi, 4,571,991, Cl. 73-118.000.

Suzuki, Haruko: *See*—
Saito, Masayuki; Suzuki, Haruko; and Oodaira, Hirosi, 4,572,843, Cl. 427-53.100.

Suzuki, Kazuhiro, to Nippon Cable System, Inc. Control device for control cables. 4,572,019, Cl. 74-471.0XY.

Suzuki, Masami: *See*—
Ueno, Keii; Ueda, Masanobu; Tanikawa, Minoru; and Suzuki, Masami, 4,571,977, Cl. 72-342.000.

Suzuki, Masaru, to Kabushiki Kaisha Tokai Rika Denki Seisakusho. Electric remote control back-mirror assembly. 4,572,626, Cl. 350-634.000.

Suzuki, Nobuyuki: *See*—
Kataoka, Hiroyuki; Yamada, Masanori; and Suzuki, Nobuyuki, 4,572,644, Cl. 354-415.000.
Shimizu, Masami; and Suzuki, Nobuyuki, 4,572,646, Cl. 354-475.000.

Suzuki, Shigeru; and Yasuda, Yuji, to Ricoh Company, Ltd. Variable magnification imaging device for copier. 4,572,658, Cl. 355-57.000.

Suzuki, Shuichi: *See*—
Ikeya, Hirotoshi; Suzuki, Shuichi; Oguni, Takayuki; Matsumoto, Kazutaka; and Hatanaka, Akiko, 4,572,853, Cl. 428-76.000.

Suzuki, Tadao; and Abe, Miki, to Sony Corporation. Digital to analog converter. 4,573,039, Cl. 340-347.0DA.

Suzuki, Takashi; Fukuda, Ryohei; and Takahashi, Kouji, to Fuji Jukogyo Kabushiki Kaisha. Router bit. 4,572,714, Cl. 408-230.000.

Suzuki, Tatsuya: *See*—
Yoshida, Yoichi; Hashimoto, Akihiko; Suzuki, Tatsuya; Shirai, Hitoshi; Akitake, Hiroshi; and Nakazawa, Hirotsugu, 4,572,645, Cl. 354-435.000.

Suzuki, Yasuo: *See*—
Takemae, Yoshihiro; and Suzuki, Yasuo, 4,572,977, Cl. 307-530.000.

Suzuyama, Tomio; and Aoki, Akira, to Tachikawa Spring Co., Ltd. Cushion member for a vehicle seat. 4,571,763, Cl. 5-464.000.

Swain, Ronald R., to Rexnord Inc. Powered transmission assembly for an accumulating conveyor. 4,572,358, Cl. 198-781.000.

Swanson, Roy T., to S&C Electric Company. Pressure-operated switch for a high-voltage interrupting module. 4,572,933, Cl. 200-151.000.

Sweeney, Paul L., Jr.: *See*—
Letterio, Fred, 4,572,212, Cl. 128-748.000.

Swick, Edwin G.; and Forsberg, Jerold M., to Illinois Tool Works Inc. Tension indicating washer improvements. 4,572,717, Cl. 411-11.000.

Swietlik, George. Drilling apparatus. 4,572,305, Cl. 175-325.000.

Swiss Aluminium Ltd.: *See*—
Haller, Walter, 4,572,280, Cl. 164-467.000.

Symons, James D.; Dershem, Ronald J.; and DeHart, Arnold O., to General Motors Corporation. Low friction dynamic seal assembly with centrifugal deflection. 4,572,516, Cl. 277-50.000.

Syracuse University: *See*—
Kowel, Stephen T.; Kornreich, Philipp G.; and Cleverly, Dennis S., 4,572,616, Cl. 350-335.000.

System E Controls Limited: *See*—
Burton, Barrie C., 4,571,839, Cl. 33-178.00E.

Szeto, Charles, to Voicetek Corporation. Method of and apparatus for voice communication storage and forwarding with simultaneous access to multiple users. 4,573,140, Cl. 364-900.000.

Szymaszek, Paul G., to Vilter Manufacturing Corporation. Electronic control for expansion valve in refrigeration system. 4,571,951, Cl. 62-212.000.

Tabata, Mitsuo: *See*—
Tojo, Toru; Mori, Ichiro; Shinozaki, Toshiaki; Sugihara, Kazuyoshi; Tabata, Mitsuo; and Itoh, Chikara, 4,572,956, Cl. 250-492.200.

Tabouy, Christian: *See*—
Vignon, Jean F. B. J.; and Tabouy, Christian, 4,572,705, Cl. 405-16.000.

Tachikawa, Shoji: *See*—
Isono, Tokio; and Tachikawa, Shoji, 4,572,317, Cl. 180-227.000.

Tachikawa Spring Co., Ltd.: *See*—
Suzuyama, Tomio; and Aoki, Akira, 4,571,763, Cl. 5-464.000.

Tachikawa, Tetsuya: *See—*
Shimizu, Fumio; Tachikawa, Tetsuya; Ikei, Nobuhiro; Noda, Atunari; Hashimura, Etsuro; and Imagawa, Kenichi, 4,572,800, Cl. 260-112.50R.

Tada, Mitsuro; Ikegami, Takeshi; and Komori, Hisao, to Sharp Kabushiki Kaisha. Copying machine with audible indicator means. 4,572,652, Cl. 355-14.00R.

Taddicken, Hermann, to Eisele Apparate-und Geratebau GmbH. Sewing machine with workpiece differential transport device. 4,572,094, Cl. 112-322.000.

Tagawa, Hisatoshi: *See—*
Suga, Masataka; Yamada, Makoto; Takahashi, Kazuhide; Iwasaki, Nobuhiro; Matsui, Kazuyuki; Izawa, Toru; Watanabe, Itaru; and Tagawa, Hisatoshi, 4,572,748, Cl. 148-12.00F.

Tagnon, Luc, to Essilor International Cie Generale d'Optique. Apparatus for presentation of eye tests for testing near and distant vision. 4,572,629, Cl. 351-243.000.

Taguchi, Masahiro: *See—*
Tsuge, Noboru; Kuwakado, Satosi; Taguchi, Masahiro; and Yasui, Toshio, 4,572,543, Cl. 280-807.000.

Taiyo Musen Co., Ltd.: *See—*
Mori, Kenzo; and Yasuda, Hyo, 4,573,053, Cl. 343-441.000.

Takagi Chemicals, Inc.: *See—*
Takagi, Sadaaki; Yura, Shigetsugu; and Fukuda, Masaki, 4,572,430, Cl. 237-2.00A.

Takagi, Sadaaki; Yura, Shigetsugu; and Fukuda, Masaki, to Takagi Chemicals, Inc. Air conditioner for vehicular seat. 4,572,430, Cl. 237-2.00A.

Takahashi, Akira: *See—*
Deguchi, Toshihisa; Ohta, Kenji; Takahashi, Akira; and Yamaoka, Hideyoshi, 4,573,149, Cl. 369-13.000.

Takahashi, Kazuhide: *See—*
Suga, Masataka; Yamada, Makoto; Takahashi, Kazuhide; Iwasaki, Nobuhiro; Matsui, Kazuyuki; Izawa, Toru; Watanabe, Itaru; and Tagawa, Hisatoshi, 4,572,748, Cl. 148-12.00F.

Takahashi, Kouji: *See—*
Suzuki, Takashi; Fukuda, Ryohei; and Takahashi, Kouji, 4,572,714, Cl. 408-230.000.

Takahashi, Michihiko; Saito, Eiichi; and Okano, Takeshi, to Fuji Photo Film Co., Ltd. Film cassette for electrophotographic camera processor-reader. 4,572,649, Cl. 355-3.00R.

Takamizawa, Daisuke; Okada, Aguri; and Ito, Hisayoshi. Display case. 4,572,593, Cl. 312-114.000.

Takao, Mitsunori: *See—*
Kamai, Kenichiro; Omori, Norio; Kinugawa, Masumi; and Takao, Mitsunori, 4,572,122, Cl. 123-206.000.

Takara Company: *See—*
Yoshikawa, Noriyuki; and Fujiyama, Kunio, 4,572,573, Cl. 297-75.000.

Takasaki, Yoshimi: *See—*
Aagano, Toshitaka; and Takasaki, Yoshimi, 4,573,159, Cl. 372-34.000.

Takase, Tsuneyoshi; and Hayashi, Yoriyuki, to Toyo CCI Kabushiki Kaisha. Emergency mask. 4,572,178, Cl. 128-205.270.

Takeda Chemical Industries, Ltd.: *See—*
Matsuo, Taisuke, deceased; Ochiai, Michihiko; and Kishimoto, Shoji, 4,572,801, Cl. 260-245.400.

Takeda, Keisou: *See—*
Okamoto, Takamitsu; and Takeda, Keisou, 4,572,128, Cl. 123-339.000.

Takeda Riken Co., Ltd.: *See—*
Ichimiya, Yoshichika; Sudo, Tsuneta; Takehisa, Turo; and Shimada, Katsumi, 4,573,120, Cl. 364-200.000.

Takehisa, Turo: *See—*
Ichimiya, Yoshichika; Sudo, Tsuneta; Takehisa, Turo; and Shimada, Katsumi, 4,573,120, Cl. 364-200.000.

Takemae, Yoshihiro; and Suzuki, Yasuo, to Fujitsu Limited. Range checking comparator. 4,572,977, Cl. 307-530.000.

Takeno, Seiichi, to Murata Manufacturing Co., Ltd. LC Composite component. 4,573,101, Cl. 361-321.000.

Takeo, Yuji: *See—*
Yoshimi, Tomohisa; and Takeo, Yuji, 4,572,207, Cl. 128-706.000.

Takeuchi, Yasuhiro; Sakakibara, Yasuyuki; and Watanabe, Kazuhide, to Nippon Soken, Inc. Fuel injection apparatus for an internal combustion engine. 4,572,136, Cl. 123-447.000.

Takimoto, Hiroyuki: *See—*
Maeda, Masaya; Hirata, Noritsugu; and Takimoto, Hiroyuki, 4,573,089, Cl. 360-77.000.

Tama Chemicals Co., Ltd.: *See—*
Shimizu, Shumpei, 4,572,769, Cl. 204-59.00R.

Tama Pack Co., Ltd.: *See—*
Yamada, Masao, 4,571,851, Cl. 36-11.500.

Tamamura, Hideo: *See—*
Harigaya, Isao; and Tamamura, Hideo, 4,572,640, Cl. 354-400.000.

Tamura Electric Works, Ltd.: *See—*
Nishimura, Tomio; Kikuchi, Junzo; Sugiura, Ryuzo; and Yoshida, Toshiro, 4,572,928, Cl. 179-99.00A.

Tamura, Yoshiharu: *See—*
Nakajima, Masataka; Mase, Yasushi; and Tamura, Yoshiharu, 4,572,135, Cl. 123-440.000.

Tanahashi, Toshio; Ito, Takaaki; and Uranishi, Koji, to Toyota Jidosha Kabushiki Kaisha. Fuel tank for use in a motor vehicle. 4,572,394, Cl. 220-86.00R.

Tanaka, Atsuo: *See—*
Funatani, Kiyoshi; Donomoto, Tadashi; Tanaka, Atsuo; and Tatematsu, Yoshiaki, 4,572,270, Cl. 164-97.000.

Tanaka, Hiroji: *See—*
Arita, Kishio; Mitani, Susumu; Sakai, Hideo; Sudo, Yoshikazu; Koide, Yoshitaka; Sato, Haruzi; Habuka, Yoshio; Kozakai, Takashi; and Tanaka, Hiroji, 4,571,999, Cl. 73-598.000.

Tanaka, Hiroshi: *See—*
Abe, Hideki; and Tanaka, Hiroshi, 4,572,822, Cl. 423-37.000.

Tanaka, Kenmei, to Kanzaki Paper Mfg. Co., Ltd. Apparatus for making labels. 4,572,686, Cl. 400-621.100.

Tanaka, Kunio: *See—*
Abe, Zenwemon; Yamada, Yoshifumi; and Tanaka, Kunio, 4,573,015, Cl. 324-309.000.

Tanaka, Masashi; and Ohki, Hiroshi, to Nippon Kogaku K.K. Objective lens for optical disc. 4,572,623, Cl. 350-480.000.

Tanaka, Osamu: *See—*
Komasaku, Seiichi; Iiyama, Hiroshi; Watanabe, Noboru; and Tanaka, Osamu, 4,571,844, Cl. 33-366.000.

Tanaka, Shigeru, to Tokyo Shibaura Denki Kabushiki Kaisha. AC Current detection circuit for a rotor driving supply source of a rotating anode X-ray tube. 4,572,973, Cl. 307-350.000.

Tanaka, Shigeru; and Onodera, Toshihiro, to Kabushiki Kaisha Toshiba. Heating circuit for a filament of an X-ray tube. 4,573,184, Cl. 378-110.000.

Tanaka, Sotaro: *See—*
Aoyagi, Yukio; Izumi, Eiki; Tanaka, Sotaro; and Yamaguchi, Takeshi, 4,571,941, Cl. 60-466.000.

Tanaka, Yuji; and Matsumoto, Hideo, to Tokai Gakki Co., Ltd. Electric guitar provided with tremolo unit. 4,572,049, Cl. 84-313.000.

Tani, Haruhisa: *See—*
Okada, Tokio; Kojima, Shigezo; and Tani, Haruhisa, 4,571,765, Cl. 8-149.300.

Tanikawa, Minoru: *See—*
Ueno, Keii; Ueda, Masanobu; Tanikawa, Minoru; and Suzuki, Masami, 4,571,977, Cl. 72-342.000.

Tanizaki, Akira: *See—*
Kigasawa, Kazuo; Shimizu, Hiroaki; Hayashi, Toshihiro; Watabe, Kazuo; Tanizaki, Akira; Koyama, Osamu; Wakisaka, Kikuo; and Ogawa, Yasuaki, 4,572,832, Cl. 424-19.000.

Tao, Thomas, to James River-Dixie/Northern, Inc. Fiber moisture control in the formation of dry-laid webs. 4,572,440, Cl. 241-23.000.

Tappan Company, The: *See—*
Schweitzer, Ronald D., 4,572,154, Cl. 126-39.00E.

Tarabout, Alain: *See—*
Grauel, Christoph; Duplessis, Philippe; and Tarabout, Alain, 4,573,206, Cl. 455-33.000.

Tarreau, Louis: *See—*
Kuntzmann, Jean-Claude; Nazet, Rene ; and Tarreau, Louis, 4,572,985, Cl. 315-3.500.

Tasaki, Hiroshi: *See—*
Ogata, Takashi; Tasaki, Hiroshi; and Kasai, Shunichi, 4,572,823, Cl. 423-49.000.

Task, Harry L.; and Genco, Louis V., to United States of America, Air Force. Variable contrast direct read-out vision tester. 4,572,630, Cl. 351-243.000.

Tate & Lyle Public Limited Co.: *See—*
Lindley, Michael G.; and Hathaway, Steven, 4,572,916, Cl. 514-777.000.

Tatematsu, Yoshiaki: *See—*
Funatani, Kiyoshi; Donomoto, Tadashi; Tanaka, Atsuo; and Tatematsu, Yoshiaki, 4,572,270, Cl. 164-97.000.

Tatum, Howard J.: *See—*
Livesay, Billy R.; Tatum, Howard J.; and Toews, Melvin R., 4,572,162, Cl. 128-1.00R.

Taube, William L.; and Roberts, David A., to Metal Box p.l.c. Method of and apparatus for forming a reinforced can end. 4,571,978, Cl. 72-349.000.

Taylor, Celia C.: *See—*
Orchard, Stanley E.; and Taylor, Celia C., 4,572,672, Cl. 356-446.000.

Taylor, George A., to A. W. Anderberg Manufacturing Co. Releasable window hinge. 4,571,776, Cl. 16-339.000.

Taylor, Raymond R. Locking device for sliding doors and/or windows. 4,572,557, Cl. 292-263.000.

Tecnomara AG: *See—*
Fischer, Thomas, 4,572,067, Cl. 101-7.000.

Tecnovar Italiana S.p.A.: *See—*
Fontana, Ludovico, 4,572,563, Cl. 294-82.240.

Tegart, Harold G. Golf course. 4,572,512, Cl. 273-176.00A.

Teitelbaum, Henry S.: *See—*
Teitelbaum, Jay M.; and Teitelbaum, Henry S., 4,572,179, Cl. 128-303.00A.

Teitelbaum, Jay M.; and Teitelbaum, Henry S. Apparatus for removing swine tails. 4,572,179, Cl. 128-303.00A.

Tektronix, Inc.: *See—*
Metz, Arthur J., 4,572,967, Cl. 307-243.000.

Teleflex Incorporated: *See—*
Sosnowski, Joseph A.; Black, Gary; and Pritchard, Robert J., 4,572,053, Cl. 89-1.510.

Telefonaktiebolaget L M Ericsson: *See—*
Carlqvist, Bengt R., 4,573,024, Cl. 331-1.00A.
Nilsson, Per-Ove, 4,573,103, Cl. 361-386.000.
Orevik, Sune A. W.; and Gronberg, Torsten R., 4,572,552, Cl. 285-253.000.

Temco, Inc.: *See—*
Brauer, Paul R.; Barnickel, Thomas J.; and Mast, Gary C., 4,572,009, Cl. 73-864.910.

Tempmaster Corporation: *See*—
Dean, Raymond H., 4,572,327, Cl. 181-295.000.
ten Eicken, Heinz: *See*—
Eisermann, Armin; ten Eicken, Heinz; Obenluneschloss, Kurt; and Geiger, Diethard, 4,572,348, Cl. 194-248.000.
Tennant Company: *See*—
Worwa, Richard G., 4,571,771, Cl. 15-319.000.
Teramachi, Hiroshi. Linear ball bearing unit. 4,572,590, Cl. 308-6.00C.
Teraoka, Masanori; Matsuda, Terumi; and Yamazaki, Hisashi, to Fuji Photo Film Co., Ltd. Radiation image storage panel. 4,572,955, Cl. 250-483.100.
Terrington, John C. Slab lifter. 4,572,566, Cl. 294-118.000.
Terrot Strickmaschinen GmbH: *See*—
Engelfried, Werner; and Mueller, Gerhard, 4,571,957, Cl. 66-115.000.
Teruhiko, Takatani: *See*—
Kanazawa, Hirotaka; Teruhiko, Takatani; Shigeki, Furutani; Chikuma, Isamu; Shimada, Satoru; and Eda, Hiroshi, 4,572,316, Cl. 180-143.000.
Tetsuno, Haruo: *See*—
Fujii, Masao; Nakao, Kazushige; and Tetsuno, Haruo, 4,572,286, Cl. 165-104.290.
Texaco Inc.: *See*—
Headley, James A., 4,572,790, Cl. 252-8.50A.
Thigpen, Arnold B., Jr.; Looney, Mark D.; and Fader, Philip D., 4,572,297, Cl. 166-307.000.
Texas Instruments Incorporated: *See*—
McLevige, William V.; Yuan, Han-Tzong; Duncan, Walter M.; and Doerbeck, Friedrich H., 4,573,064, Cl. 357-16.000.
Peterson, James R., 4,572,772, Cl. 204-141.500.
Reid, Lee R., 4,572,886, Cl. 430-152.000.
Textilma AG: *See*—
Speich, Francisco, 4,572,247, Cl. 139-455.000.
Tezuka, Nobuo; and Ogura, Tokihiko, to Canon Kabushiki Kaisha. Recording apparatus. 4,573,087, Cl. 360-60.000.
Theobald, Adolf. Device for storing pallets and removing them from storage. 4,572,719, Cl. 414-277.000.
Theurer, Josef, to Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H. Mobile track leveling, lining and tamping machine. 4,572,079, Cl. 104-7.00B.
Thielemann, Klaus: *See*—
Entmayr, Peter; Rohde, Dieter; and Thielemann, Klaus, 4,572,262, Cl. 152-501.000.
Thigpen, Arnold B., Jr.; Looney, Mark D.; and Fader, Philip D., to Texaco Inc. Method of formation permeability treatment with alkali metal hydroxide. 4,572,297, Cl. 166-307.000.
Thiokol Corporation: *See*—
Faupell, Lawrence C., 4,571,800, Cl. 29-157.00C.
Thom, Ian G.: *See*—
Gooch, Ian D.; and Thom, Ian G., 4,572,660, Cl. 355-99.000.
Thomas, Larry E.: *See*—
Korenko, Michael K.; Gelles, David S.; and Thomas, Larry E., 4,572,738, Cl. 75-128.00Z.
Thomas, Perry W. Roller skate. 4,572,529, Cl. 280-11.1BR.
Thomenius, Kai E., to Elscint Inc. Method and apparatus for high-speed ultrasonic imaging. 4,572,202, Cl. 128-660.000.
Thompson, Leonard J., to Value Oriented Technology Inc. Function assist control for pressure relief valve. 4,572,237, Cl. 137-487.500.
Thompson, Thomas K., to Owens-Corning Fiberglas Corporation. Foamable liquid distributing means. 4,572,435, Cl. 239-553.500.
Thomsen, Kurt: *See*—
Amotz, Shmuel; Rugh, Susanne; Markussen, Erik K.; and Thomsen, Kurt, 4,572,897, Cl. 435-177.000.
Thomson-CSF: *See*—
Bouko, Jean; Durand, Jean-Claude; Le Foll, Jean; and Salvat, Francois, 4,573,054, Cl. 343-786.000.
Deman, Pierre; and Butin, Henri, 4,573,209, Cl. 455-73.000.
Dudome, Michel; and Dupressoir, Albert, 4,573,056, Cl. 343-795.000.
Gombert, Jean; Blaison, Serge; Quinty, Christian; and Gazard, Maryse, 4,572,840, Cl. 427-36.000.
Grimaldi, Jean-Luc, 4,573,172, Cl. 375-116.000.
Guillerot, Jean C.; Joncour, Hubert; Auvray, Gerard; and Balduzzi, Daniel, 4,573,052, Cl. 343-18.00E.
Kuntzmann, Jean-Claude; Nazet, Rene ; and Tarreau, Louis, 4,572,985, Cl. 315-3.500.
Thomson, Robert I.: *See*—
Casper, Mark S.; and Thomson, Robert I., 4,572,496, Cl. 270-52.500.
Thurlow, John: *See*—
Williams, Derrick G.; Thurlow, John; and Bushnell, John J., 4,572,080, Cl. 104-252.000.
Thurne Engineering Company Limited: *See*—
Antonissen, Peter, 4,572,044, Cl. 83-42.000.
Thyssen Industrie Aktiengesellschaft: *See*—
Harder, Helmut, 4,572,550, Cl. 285-47.000.
Tiegel Manufacturing Co.: *See*—
Wegner, Paul C., 4,572,746, Cl. 134-10.000.
Tijs, Hendricus C. P., to Weld-Equip b.v. Welding head for resistance-welding. 4,572,940, Cl. 219-86.250.
Timari, Jali. U-Shaped support and pivotal lever for fixing a barrel to the body of a firearm. 4,571,871, Cl. 42-75.00A.
Timberjack Inc.: *See*—
Johnson, Thomas E., 4,572,567, Cl. 294-119.400.
Timme, William F., to Adam, William S.; and Walsh, John J. Digital readout indicator of oxygen usage, pressure and flow. 4,571,995, Cl. 73-199.000.
Tipton, Russell C.: *See*—
Selfridge, Glenn D.; and Tipton, Russell C., 4,572,427, Cl. 236-3.000.
Tisue, Gil; and Kondo, Ryuji, to Fuji Photo Film Co., Ltd. Image sensor including a repeating read function. 4,573,076, Cl. 358-212.000.
TMC Corporation: *See*—
Vinazzer, Edith; and Sollak, Johann, 4,572,540, Cl. 280-612.000.
Tochigi Seiko Co., Ltd.: *See*—
Kawashima, Yonesaburo, 4,571,768, Cl. 15-167.00R.
Tocksfors Verkstads AB: *See*—
Ahs, Vilgot, 4,572,755, Cl. 156-166.000.
Toda, Jitsuo; and Shimizu, Wataru, to Kabushiki Kaisha SG. System for detecting an absolute position. 4,572,951, Cl. 250-231.0SE.
Toews, Melvin R.: *See*—
Livesay, Billy R.; Tatum, Howard J.; and Toews, Melvin R., 4,572,162, Cl. 128-1.00R.
Tojo, Toru; Mori, Ichiro; Shinozaki, Toshiaki; Sugihara, Kazuyoshi; Tabata, Mitsuo; and Itoh, Chikara, to Tokyo Shibaura Denki Kabushiki Kaisha. Electron beam pattern transfer system having an autofocusing mechanism. 4,572,956, Cl. 250-492.200.
Tokai Gakki Co., Ltd.: *See*—
Tanaka, Yuji; and Matsumoto, Hideo, 4,572,049, Cl. 84-313.000.
Toki, Satoshi: *See*—
Kasugai, Joji; Kuniyoshi, Toru; and Toki, Satoshi, 4,572,396, Cl. 220-203.000.
Tokico Ltd.: *See*—
Miura, Yukio, 4,572,405, Cl. 222-14.000.
Tokyo Electric Co., Ltd.: *See*—
Nishiyama, Yoshihisa, 4,572,309, Cl. 177-50.000.
Tokyo Kogaku Kikai Kabushiki Kaisha: *See*—
Ikezawa, Yukio; and Yoshino, Hisakazu, 4,571,842, Cl. 33-200.000.
Tokyo Shibaura Denki Kabushiki Kaisha: *See*—
Iida, Kazuhiko, 4,573,084, Cl. 358-300.000.
Ikeya, Hirotoshi; Suzuki, Shuichi; Oguni, Takayuki; Matsumoto, Kazutaka; and Hatanaka, Akiko, 4,572,853, Cl. 428-76.000.
Kidode, Masatsugu; and Kuno, Yoshinori, 4,573,191, Cl. 382-1.000.
Matsukawa, Naohiro, 4,573,143, Cl. 365-175.000.
Ohhashi, Masahide, 4,573,137, Cl. 364-788.000.
Sakai, Tetsuro; and Honda, Kazuhiko, 4,573,086, Cl. 358-11.000.
Tanaka, Shigeru, 4,572,973, Cl. 307-350.000.
Tojo, Toru; Mori, Ichiro; Shinozaki, Toshiaki; Sugihara, Kazuyoshi; Tabata, Mitsuo; and Itoh, Chikara, 4,572,956, Cl. 250-492.200.
Tom, Gary E.: *See*—
Greene, Richard E.; Young, Gladstone F.; Tom, Gary E.; Schaffer, Harry G.; and Foote, John S., 4,573,152, Cl. 371-22.000.
Tomioka, Isao: *See*—
Imahori, Kazutomo; Nakajima, Hiroshi; Iwasaki, Tatsuo; Tomioka, Isao; and Yamamoto, Keiichi, 4,572,894, Cl. 435-68.000.
Tomita, Nobuya, to National Distillers and Chemical Corporation. Autofrettage process. 4,571,969, Cl. 72-56.000.
Topazon Limited: *See*—
Fiedler, Marc F., 4,572,158, Cl. 126-263.000.
Toray Industries, Inc.: *See*—
Iwayama, Kazuyoshi; Inoue, Takehisa; Sato, Kimio; Hayakawa, Norio; and Fujii, Masaki, 4,572,779, Cl. 208-111.000.
Toriumi, Mototada; and Kanemitsu, Shinji, to Canon Kabushiki Kaisha. Image forming apparatus. 4,572,648, Cl. 355-3.0FU.
Toro Company, The: *See*—
White, Donald M., III, 4,571,831, Cl. 30-276.000.
Torok, Robert J.: *See*—
Stock, Arthur J.; Christofer, Donald E.; Homer, John C.; Torok, Robert J.; and Whittington, Thomas, 4,572,710, Cl. 414-146.000.
Toyama, Koichi, to Nippondenso Co., Ltd. Ignition system for internal combustion engines. 4,572,151, Cl. 123-622.000.
Toyo CCI Kabushiki Kaisha: *See*—
Takase, Tsuneyoshi; and Hayashi, Yoriyuki, 4,572,178, Cl. 128-205.270.
Toyoda Gosei Co., Ltd.: *See*—
Kasugai, Joji; Kuniyoshi, Toru; and Toki, Satoshi, 4,572,396, Cl. 220-203.000.
Mabuchi, Akira; and Yano, Kenji, 4,572,871, Cl. 428-423.100.
Ono, Satoshi; Sugita, Hiroshi; and Hiramitsu, Tetsushi, 4,572,313, Cl. 180-78.000.
Yamazaki, Yoshio; Mabuchi, Akira; and Yano, Kenji, 4,572,872, Cl. 428-423.100.
Toyono, Tsutomu: *See*—
Fujii, Haruo; Sakemi, Yuji; and Toyono, Tsutomu, 4,573,061, Cl. 346-153.100.
Toyoshi, Naoki: *See*—
Yuge, Shizuo; Oka, Tateki; Sakakibara, Susumu; and Toyoshi, Naoki, 4,572,102, Cl. 118-689.000.
Toyota Jidosha Kabushiki Kaisha: *See*—
Funatani, Kiyoshi; Donomoto, Tadashi; Tanaka, Atsuo; and Tatematsu, Yoshiaki, 4,572,270, Cl. 164-97.000.
Horiuchi, Yusuke; and Ootani, Hisao, 4,572,344, Cl. 192-106.100.
Ikeda, Shinji, 4,572,119, Cl. 123-145.00A.
Katayama, Nobuaki, 4,572,020, Cl. 74-477.000.
Okamoto, Takamitsu; and Takeda, Keisou, 4,572,128, Cl. 123-339.000.
Shiraishi, Daiichi, 4,571,886, Cl. 49-374.000.
Tanahashi, Toshio; Ito, Takaaki; and Uranishi, Koji, 4,572,394, Cl. 220-86.00R.

Tsukamoto, Keisuke; Nagase, Masaomi; and Matsuno, Kiyotaka, 4,572,130, Cl. 123-357.000.
Toyota Jidosha Kogyo Kabushiki Kaisha: *See*—
Kinugasa, Yukio; and Yaegashi, Takehisa, 4,572,029, Cl. 74-866.000.
Tran Van, Guy: *See*—
Guitteny, Jean-Louis; Pernod, Roger; Roques, Christian; and Tran Van, Guy, 4,572,839, Cl. 426-646.000.
Transamerica Delaval Inc.: *See*—
Chatfield, William W., 4,571,803, Cl. 29-235.000.
Traumumiller, Gottfried; Maier, Wilfried; Schoffmann, Franz; and Wrulich, Herwig, to Voest-Alpine Aktiengesellschaft. Cutting head for drift advancing machines and process for producing same. 4,572,583, Cl. 299-81.000.
Traylor, John C. A., to Nordson Corporation. Airless spray gun having improved nozzle assembly and electrode circuit connections. 4,572,438, Cl. 239-708.000.
Tribolet, David C.; and Paulsen, David L., to Hewlett-Packard Company. Automatic pen-sensor. 4,573,129, Cl. 364-520.000.
Trio Kabushiki Kaisha: *See*—
Yamada, Yuji, 4,573,019, Cl. 330-257.000.
Trucco, Dario, to Industrie Pininfarina S.p.A. Flexible top for soft-top motor vehicles. 4,572,570, Cl. 296-107.000.
Truhan, Andrew: *See*—
Huffman, Albertus W., Jr.; and Truhan, Andrew, 4,572,429, Cl. 237-2.00B.
Trumpf America, Inc.: *See*—
Leibinger, Berthold, 4,571,810, Cl. 29-412.000.
Truninger, Walter: *See*—
Engelberg, Franz; Fabris, Luciano; Schneider, Robert; Villinger, Gerhard; and Truninger, Walter, 4,572,485, Cl. 266-227.000.
TRW Inc.: *See*—
Blazek, William S., 4,572,275, Cl. 164-339.000.
Brooks, Robert E., 4,572,948, Cl. 250-227.000.
Tseng, Samuel C.: *See*—
Chen, Shu-Chun; and Tseng, Samuel C., 4,573,199, Cl. 382-47.000.
Tsuboi, Shunji: *See*—
Shinma, Mitsuru; Kobayashi, Toyohiro; Mori, Masahito; Tsuboi, Shunji; and Sugita, Masaru, 4,573,059, Cl. 346-76.0PH.
Tsuchikura, Akira: *See*—
Ogawa, Masaki; Hirata, Yasushi; and Tsuchikura, Akira, 4,572,263, Cl. 152-537.000.
Tsuchiya, Eiichi, to Victor Company of Japan, Ltd. Video recording-/reproducing apparatus with tape slack in back-space editing mode. 4,573,090, Cl. 360-85.000.
Tsuchiya, Sadatomo: *See*—
Hasegawa, Shumpei; Shiraiwa, Michitaka; and Tsuchiya, Sadatomo, 4,572,149, Cl. 123-589.000.
Tsudakoma Corp.: *See*—
Komatsu, Tokuji, 4,571,792, Cl. 28-180.000.
Tsuge, Akihiko: *See*—
Inoue, Hiroshi; Tsuge, Akihiko; and Komeya, Katsutoshi, 4,572,844, Cl. 427-180.000.
Tsuge, Noboru; Kuwakado, Satosi; Taguchi, Masahiro; and Yasui, Toshio, to Nippon Soken, Inc.; and Nippondenso Co., Ltd. Retractable safety belt system. 4,572,543, Cl. 280-807.000.
Tsukamoto, Keisuke; Nagase, Masaomi; and Matsuno, Kiyotaka, to Toyota Jidosha Kabushiki Kaisha. Method of controlling individual cylinder fuel injection quantities in electronically controlled diesel engine and device therefor. 4,572,130, Cl. 123-357.000.
Tsunoda, Teruo; and Kokawa, Ryoichi, to Komori Printing Machinery Co., Ltd. Method and system of processing image signals. 4,573,190, Cl. 382-1.000.
Tsuruta, Yasuo. Desalting irrigation and its apparatus. 4,572,706, Cl. 405-36.000.
Tsuyuki, Shinichi: *See*—
Saito, Hiroshi; Okayasu, Hiromasa; Tsuyuki, Shinichi; Kawana, Takeshi; Mifune, Takao; and Yoshizaki, Masanori, 4,571,822, Cl. 29-736.000.
Tsuzuki, Yu; Watanabe, Hiroshi; and Niwa, Katsuhisa, to West Electric Company, Ltd. Automatic film loading system. 4,572,635, Cl. 354-173.100.
Tuckerman, David B.; and Pease, Roger F. W., to Leland Stanford Junior University, The Board of Trustees of the. Method and means for improved heat removal in compact semiconductor integrated circuits. 4,573,067, Cl. 357-82.000.
Tunell, Lars-Erik, to Santrade Limited. Rock drill. 4,572,307, Cl. 175-410.000.
Ube Industries, Ltd.: *See*—
Masayuki, Kiyosawa; Nobuaki, Inoue; and Eiichi, Sonoda, 4,572,727, Cl. 55-414.000.
Udy, Lex L.: *See*—
Day, John T.; and Udy, Lex L., 4,572,075, Cl. 102-313.000.
Ueda, Masanobu: *See*—
Ueno, Keii; Ueda, Masanobu; Tanikawa, Minoru; and Suzuki, Masami, 4,571,977, Cl. 72-342.000.
Ueda, Yoshihiko; Saito, Ikuo; Sakae, Kazumasa; and Oogiri, Tetuo, to Onoda Cement Co., Ltd. Thermal decomposition furnace of waste tires. 4,572,082, Cl. 110-245.000.
Uemura, Michio; Sato, Yutaka; Nakamura, Masaru; and Iida, Toyoshi, to Japan Metals and Chemicals Co., Ltd. Drilling fluid additives. 4,572,789, Cl. 252-8.50A.
Uemura, Noboru; Sahara, Hiroaki; and Hirayama, Yasunori, to Sumitomo Wall Systems, Ltd. Reversible window with a movable rotary shaft. 4,571,885, Cl. 49-177.000.
Ueno, Haruyuki: *See*—
Matano, Taiji; Ueno, Haruyuki; and Fukuda, Kazushige, 4,572,902, Cl. 501-97.000.
Sato, Nobuhiro; Katsura, Yuji; and Ueno, Haruyuki, 4,572,828, Cl. 423-344.000.
Ueno, Keii; Ueda, Masanobu; Tanikawa, Minoru; and Suzuki, Masami, to Hitachi, Ltd. Method of forging flanged shaft. 4,571,977, Cl. 72-342.000.
Uhl, Robert F.: *See*—
Bruno, Robert H.; Johns, Robert G.; Kipperman, Stuart; Mayer, Geoffrey R.; Protzmann, Donald E.; and Uhl, Robert F., 4,572,365, Cl. 206-306.000.
Umeda, William: *See*—
Hug, Paul; Umeda, William; Chapdelaine, Paul; and Paul, Raymond E., 4,572,421, Cl. 228-103.000.
Umesaki, Shigeo; and Hasegawa, Shumpei, to Honda Giken Kogyo K.K. Apparatus for detecting and indicating abnormality in an electronic control system for internal combustion engines. 4,572,143, Cl. 123-479.000.
Umezawa, Yujiro; Sano, Shigehisa; and Ogino, Takao, to Bridgestone Tire Co., Ltd. Pneumatic radial tires. 4,572,264, Cl. 152-451.000.
Uneek Cap and Coor, Inc.: *See*—
Wentzel, Harold G., 4,572,268, Cl. 160-201.000.
Uniconfis Corporation: *See*—
Fontlladosa, Enrique B., 4,572,361, Cl. 206-45.190.
Unie van Kunstmestfabrieken B.V.: *See*—
Biermans, Andreas J.; Burks, Henk C.; and Raemaekers, Karel G. H., 4,572,676, Cl. 374-17.000.
Biermans, Andreas J.; and Burks, Henk C., 4,572,830, Cl. 423-659.000.
Union Carbide Corporation: *See*—
Botos, Ernest D., 4,572,877, Cl. 429-53.000.
Chiu, Herman S., 4,572,098, Cl. 118-33.000.
Dominick, George C., 4,572,744, Cl. 134-7.000.
Fuderer, Andrija, 4,572,829, Cl. 423-359.000.
Union Oil Company of California: *See*—
Ward, John W., 4,572,778, Cl. 208-89.000.
Watkins, David R., 4,572,296, Cl. 166-303.000.
Unisabi, S.A.: *See*—
Guitteny, Jean-Louis; Pernod, Roger; Roques, Christian; and Tran Van, Guy, 4,572,839, Cl. 426-646.000.
United Air Lines, Inc.: *See*—
Samuelsson, Frank A., 4,571,758, Cl. 5-86.000.
United Biscuits (UK) Limited: *See*—
Masters, Adrian G., 4,572,061, Cl. 99-331.000.
United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the: *See*—
Elliott, Charles T.; and White, Anthony M., 4,572,953, Cl. 250-338.000.
United States of America
Air Force: *See*—
Barker, Robert E., Jr.; and Chen, Daniel Y., 4,573,010, Cl. 324-158.00F.
Borger, William U., 4,572,961, Cl. 290-4.00R.
Buchalter, Michael S.; Hopwood, Francis W.; and Haynes, James T., 4,573,027, Cl. 333-17.00R.
Holmberg, Arthur, Jr.; and Altman, Earl M., 4,572,488, Cl. 267-8.00R.
Josephson, Vernal; and Greenberg, Edmond L., 4,572,954, Cl. 250-370.000.
Nash, Dudley O.; and Crowley, James A., 4,571,936, Cl. 60-39.310.
O'Meara, Thomas R., 4,573,157, Cl. 372-19.000.
Petrosky, Kenneth J., 4,573,177, Cl. 377-60.000.
Task, Harry L.; and Genco, Louis V., 4,572,630, Cl. 351-243.000.
Army: *See*—
Daly, Charles J., 4,571,985, Cl. 73-38.000.
Dixon, Samuel, Jr.; and Jacobs, Harold, 4,573,213, Cl. 455-330.000.
Johnson, Joseph L., 4,572,052, Cl. 86-48.000.
Roberts, Thomas G.; and Honeycutt, Thomas E., 4,571,954, Cl. 62-514.00R.
Silverman, Bernard B., 4,572,662, Cl. 356-5.000.
Energy: *See*—
Abraham, Marvin M.; Boldu, Jose L.; Chen, Yok; and Orera, Victor M., 4,572,618, Cl. 350-354.000.
Benson, David K.; Burrows, Richard W.; and Shinton, Yvonne D., 4,572,864, Cl. 428-305.500.
Botts, Thomas E.; Powell, James R.; and Lenard, Roger, 4,572,285, Cl. 165-104.280.
Ciszek, Theodore F., 4,572,812, Cl. 264-25.000.
Fritz, Robert J., 4,572,003, Cl. 73-861.180.
Harast, Donald G., 4,572,939, Cl. 219-85.00M.
Honig, Emanuel M., 4,572,964, Cl. 307-106.000.
Korenko, Michael K.; Gelles, David S.; and Thomas, Larry E., 4,572,738, Cl. 75-128.00Z.
Postma, Arlin K., 4,572,007, Cl. 73-863.120.
Silver, Gary L., 4,572,797, Cl. 252-631.000.
Health and Human Services: *See*—
Hampar, Berge; Zweig, Martin; and Showalter, Stephen D., 4,572,896, Cl. 435-172.200.
National Aeronautics and Space Administration: *See*—
White, Paul R., 4,572,004, Cl. 73-861.580.
Navy: *See*—

Dickey, Joseph W.; and Powell, Lloyd E., 4,571,994, Cl. 73-168.000.
Mooradian, Gregory C., 4,573,214, Cl. 455-605.000.
Spargo, John D.; Neild, A. Bayne; and Phillips, Martha M., 4,572,518, Cl. 277-75.000.
Waters, William M., 4,573,050, Cl. 343-17.10R.
Wohltjen, Henry, 4,572,900, Cl. 436-151.000.

Transportation: *See—*
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U.S. Philips Corporation: *See—*
Grauel, Christoph; Duplessis, Philippe; and Tarabout, Alain, 4,573,206, Cl. 455-33.000.
Kommoss, Klaus, 4,573,088, Cl. 360-71.000.
Koomen, Cornelis J., 4,573,047, Cl. 340-825.670.
Kupfer, Karl H., 4,573,211, Cl. 455-188.000.
Schouhamer Immink, Kornelis A., 4,573,034, Cl. 340-347.0DD.
Valkestijn, Leonardus A. A.; and Bergmans, Christianus H. J., 4,572,994, Cl. 315-411.000.
van de Plassche, Rudy J., 4,573,005, Cl. 323-315.000.
van Gerwen, Petrus J.; and Snijders, Wilfred A. M., 4,573,169, Cl. 375-55.000.
Whight, Kenneth R., 4,573,066, Cl. 357-52.000.

United States Steel Corporation: *See—*
Mazur, Chester C., 4,573,128, Cl. 364-509.000.

United Technologies Corporation: *See—*
Rosenbush, David M.; and Couch, Robert P., 4,573,123, Cl. 364-431.020.
Sanborn, Harold C.; Carago, Frank; and Kreeger, John R., 4,571,983, Cl. 72-462.000.

Unitika Ltd.: *See—*
Imahori, Kazutomo; Nakajima, Hiroshi; Iwasaki, Tatsuo; Tomioka, Isao; and Yamamoto, Keiichi, 4,572,894, Cl. 435-68.000.

Universal Photonics, Inc.: *See—*
Pinnow, Douglas A., 4,573,046, Cl. 340-825.560.

University of British Columbia, The: *See—*
Evans, Robert L., 4,572,123, Cl. 123-262.000.

University of Florida: *See—*
Green, Alex E. S.; and Green, Bruce A. S., 4,572,084, Cl. 110-261.000.

University of Michigan, The: *See—*
Barry, Daniel T., 4,571,750, Cl. 623-258.000.

University of New Hampshire: *See—*
LaCourse, John R., 4,572,199, Cl. 128-657.000.

University of Oklahoma, Board of Regents for The: *See—*
Jackman, Warren M.; and Lazzara, Ralph, 4,572,192, Cl. 128-419.0PG.

Upham, Niel F. Enclosing-type fishing pole carrier. 4,572,416, Cl. 224-326.000.

Uranishi, Koji: *See—*
Tanahashi, Toshio; Ito, Takaaki; and Uranishi, Koji, 4,572,394, Cl. 220-86.00R.

URSUS Konsult AB: *See—*
Nordenstrom, Bjorn E. W.; and Olsson, Mats J., 4,572,214, Cl. 128-785.000.

Uslar, George C. Apparatus for shipping nail head leads and loading the same into a manufacturing fixture. 4,572,367, Cl. 206-328.000.

Utah Medical Products, Inc.: *See—*
Cutler, Christopher A.; Wallace, William D.; and Westenskow, Dwayne R., 4,572,208, Cl. 128-718.000.

Utaka, Katsuyuki; Sakai, Kazuo; and Akiba, Shigeyuki, to Kokusai Denshin Denwa Kabushiki Kaisha. Distributed feedback semiconductor laser. 4,573,158, Cl. 372-32.000.

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Sakai, Kazuo; Matsushima, Yuichi; Akiba, Shigeyuki; and Utaka, Katsuyuki, 4,573,161, Cl. 372-45.000.

Valdes-Neri, Jaime: *See—*
Gomez-Sanchez, Abel; Valdes-Neri, Jaime; and Quintero, Miguel H. C., 4,572,732, Cl. 65-271.000.

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Villata, Gino, 4,572,334, Cl. 188-71.600.

Valkestijn, Leonardus A. A.; and Bergmans, Christianus H. J., to U.S. Philips Corporation. Circuit arrangement for a picture display device for generating a sawtooth line deflection current. 4,572,994, Cl. 315-411.000.

Valley Engineering, Inc.: *See—*
Caron, Ronald L., 4,572,315, Cl. 180-134.000.

Value Oriented Technology Inc.: *See—*
Thompson, Leonard J., 4,572,237, Cl. 137-487.500.

Vana Industries Ltd.: *See—*
Van Abbema, Art, 4,572,726, Cl. 55-337.000.

Van Abbema, Art, to Vana Industries Ltd. Cyclone separator. 4,572,726, Cl. 55-337.000.

Van Becelaere, Robert M., to Philips Industrial Components, Inc. Access door construction. 4,572,240, Cl. 138-92.000.

van Blerk, Victor B.: *See—*
Morrison, Elden R.; Mayer, Edward F.; Pfeuffer, Donald F.; and van Blerk, Victor B., 4,572,655, Cl. 355-15.000.

van de Plassche, Rudy J., to U.S. Philips Corporation. Current source arrangement having a precision current-mirror circuit. 4,573,005, Cl. 323-315.000.

Vanderbush, Herman H., Jr.; and Yarbrough, Hugh W., to Miller Brewing Company. Bottle decapper. 4,572,033, Cl. 81-3.200.

van der Lee, Ernst M.: *See—*
Heuker of Hoek, Johannes G. J.; Clement, Cornelis J.; and van der Lee, Ernst M., 4,573,043, Cl. 340-571.000.

Vanderschaaf, Donald, to Wehr Corporation. Environmental test chamber. 4,572,283, Cl. 165-61.000.

VanDuyn, Martin, to Canadian General Electric Company Limited. Commutator stud vibration damping arrangement. 4,572,978, Cl. 310-51.000.

Vanegmond, Cor F.; and Van Meurs, Peter, to Shell Oil Company. Heater cable installation. 4,572,299, Cl. 166-385.000.

van Gerwen, Petrus J.; and Snijders, Wilfred A. M., to U.S. Philips Corporation. Communication system for bi-phase transmission of data and having sinusoidal low pass frequency response. 4,573,169, Cl. 375-55.000.

Vangheluwe, Jozef: *See—*
Bijttebier, Gaspar A. H.; and Vangheluwe, Jozef, 4,572,499, Cl. 271-251.000.

van Hes, Roelof; and Grosscurt, Arnoldus C., to Duphar International Research B.V. Insecticidal 4-substituted-3-chlorophenyl-1-(fluoroalkoxyphenylcarbamoyl)pyrazolines. 4,572,914, Cl. 514-403.000.

Van Kirk, LeRoy: *See—*
Kapp, Gregory W.; and Van Kirk, LeRoy, 4,572,568, Cl. 296-39.00R.

van Loveren, Augustinus G.; Sprecker, Mark A.; Whelan, Patrick; and Hanna, Marie R., to International Flavors & Fragrances Inc. 1,1,4,7-Tetramethyl-3-indanone, product produced thereby and organoleptic uses thereof. 4,572,796, Cl. 252-522.00R.

Van Meurs, Peter: *See—*
Vanegmond, Cor F.; and Van Meurs, Peter, 4,572,299, Cl. 166-385.000.

VanSchaick, Thomas E.: *See—*
Anderson, James M.; Schultz, William R., Jr.; VanSchaick, Thomas E.; and Anderson, Frank E., Jr., 4,572,980, Cl. 310-214.000.

Varian Associates, Inc.: *See—*
Codrington, Robert S., 4,572,198, Cl. 128-653.000.

Vasta, Joseph A., to Du Pont de Nemours, E. I., and Company. Chlorosulfonated ethylene vinyl acetate polymer coating composition. 4,572,870, Cl. 428-416.000.

VDO Adolf Schindling AG: *See—*
Nickol, Friedrich W.; and Baeger, Holm, 4,572,615, Cl. 350-334.000.
Vogler, Hans-Ulrich; Ruschek, Gerhard; and Schlick, Horst, 4,572,478, Cl. 251-305.000.

Velodyne Acoustics, Inc.: *See—*
Hall, David S., 4,573,189, Cl. 381-96.000.

Veramontes Brown, Federico: *See—*
Herrera Giammattei, Octavio; Veramontes Brown, Federico; Beltran Leyva, Benedo; and Cervantes Patino, Damian, 4,572,068, Cl. 101-35.000.

Vercon, Inc.: *See—*
Fortuna, Vincent E., 4,572,851, Cl. 428-35.000.

Versatile Corporation: *See—*
Pakosh, Daniel, 4,572,215, Cl. 130-27.00R.

Vervacke, Steven L.: *See—*
Miller, Robert E.; and Vervacke, Steven L., 4,573,063, Cl. 346-216.000.

Vesborg, Steen, to Colgate-Palmolive Company. Container with catenary-formed contour. 4,572,384, Cl. 215-1.00C.

Victor Company of Japan, Ltd.: *See—*
Enami, Ken, 4,572,995, Cl. 318-314.000.
Sugiyama, Hiroyuki; Sakurai, Masaki; Abe, Ryozo; Yusa, Yasuhiro; Yoshihara, Kenji; and Saito, Takashi, 4,573,092, Cl. 360-97.000.
Tsuchiya, Eiichi, 4,573,090, Cl. 360-85.000.

Vignon, Jean F. B. J.; and Tabouy, Christian. Revetment of cellular textile material. 4,572,705, Cl. 405-16.000.

Villamosipari Kutato Intezet: *See—*
Sooki-Toth, Gabor; Horvath, Pal; Jedlovszky, Palne ; Keszler, Jozsef; and Sors, Laszlo , 4,572,793, Cl. 252-182.100.

Villata, Gino, to Valeo. Hydraulically controlled brake. 4,572,334, Cl. 188-71.600.

Ville de Paris: *See—*
Le Cacheux, Paul; Schuch, Andre; and Perrot, Alain C., 4,571,898, Cl. 52-36.000.

Villinger, Gerhard: *See—*
Engelberg, Franz; Fabris, Luciano; Schneider, Robert; Villinger, Gerhard; and Truninger, Walter, 4,572,485, Cl. 266-227.000.

Vilter Manufacturing Corporation: *See—*
Szymaszek, Paul G., 4,571,951, Cl. 62-212.000.

Vinazzer, Edith; and Sollak, Johann, to TMC Corporation. Safety ski binding. 4,572,540, Cl. 280-612.000.

Viodet, Patrice: *See—*
Bernard, Jean; Beyl, Jean; le Faou, Daniel; Peyre, Henri; and Viodet, Patrice, 4,572,541, Cl. 280-628.000.

Vitro Tec Fideicomiso: *See—*
Herrera Giammattei, Octavio; Veramontes Brown, Federico; Beltran Leyva, Benedo; and Cervantes Patino, Damian, 4,572,068, Cl. 101-35.000.

Vitrocrisa Cristaleria, S.A.: *See—*
Gomez-Sanchez, Abel; Valdes-Neri, Jaime; and Quintero, Miguel H. C., 4,572,732, Cl. 65-271.000.

Voest-Alpine Aktiengesellschaft: *See—*
Hirschmanner, Franz, 4,572,453, Cl. 242-72.00R.
Mullner, Paul; and Enkner, Bernhard, 4,572,281, Cl. 165-1.000.
Sellner, Jorg; Siegwart, Rudolf; and Grauli, Siegfried, 4,571,796, Cl. 29-27.00R.
Traumumiller, Gottfried; Maier, Wilfried; Schoffmann, Franz; and Wrulich, Herwig, 4,572,583, Cl. 299-81.000.

Vogeleer, John P.: *See—*
Pirl, William E.; and Vogeleer, John P., 4,571,821, Cl. 29-727.000.
Vogler, Hans-Ulrich; Ruschek, Gerhard; and Schlick, Horst, to VDO Adolf Schindling AG. Throttle-valve connection piece. 4,572,478, Cl. 251-305.000.
Vogt, Kuno J. Resealable closure assembly for a container. 4,572,413, Cl. 222-528.000.
Voicetek Corporation: *See—*
Szeto, Charles, 4,573,140, Cl. 364-900.000.
Voigt, Ulrich; Hor, Leopold; and Stoebrich, Werner, to Siemens Aktiengesellschaft. Cover for rack cabinets, particularly for data processing equipment. 4,572,597, Cl. 312-257.0SK.
Vsesojuzny Nauchno-Issledova-Telsky I Proektny Institut Po Ochistke Tekhnolo: *See—*
Iosnpa, Vladimir G.; Kirievsky, Boris A.; Kravchenko, Anatoly P.; Kudinov, Gennady A.; Kutsykovich, Dorina B.; Lysenko, Evgeny E.; Shokul, Anatoly A.; Nekrasov, Ignaty N.; Filipiev, Oleg V.; and Lugansky, Vladimir P., 4,572,269, Cl. 164-93.000.
W. Braun Company: *See—*
Rosenwinkel, Karen W.; and Jinks, Jerry R., 4,572,224, Cl. 132-88.500.
W. H. Wallo & Associates, Inc.: *See—*
Wallo, William H., 4,572,379, Cl. 211-57.100.
W. K. Wheeler, Inc.: *See—*
Wheeler, William K., 4,572,227, Cl. 135-72.000.
W. Schlafhorst & Co: *See—*
Kupper, Wilhelm, 4,571,931, Cl. 57-281.000.
W. Schlafhorst & Co.: *See—*
Bertrams, Josef, 4,571,929, Cl. 57-22.000.
Kamp, Heinz; and Zitzen, Wilhelm, 4,572,459, Cl. 242-150.00R.
Raasch, Hans, 4,572,447, Cl. 242-35.50A.
Rohner, Joachim, 4,571,928, Cl. 57-22.000.
W. Schmidt GmbH & Co. K.G.: *See—*
Dimitriou, Michael H., 4,572,766, Cl. 159-28.000.
W. Schneider & Co. AG, Metallwarenfabrik: *See—*
Schneider, Walter, 4,572,392, Cl. 220-4.00R.
Wacker-Chemitronic Gesellschaft fur Elektronik-Grundstoffe mbH: *See—*
Lang, Winfried; Griesshammer, Rudolf; Schwab, Michael; and Zulehner, Werner, 4,572,729, Cl. 65-18.100.
Wada, Tsuneo: *See—*
Sato, Keiji; Kasuya, Takahira; Yamakawa, Goichi; and Wada, Tsuneo, 4,572,885, Cl. 430-99.000.
Wade, James J., to Riker Laboratories, Inc. Triazolo[1,5-c]pyrimidines substituted by nitrogen-containing heterocyclic rings. 4,572,916, Cl. 514-222.000.
Wafios Maschinenfabrik GmbH & Co. KG: *See—*
Lange, Gerhard, 4,572,249, Cl. 140-92.600.
Wagoner, Dorothy M. Coverlet for non-ambulatory patients. 4,571,743, Cl. 2-88.000.
Wakely, Wilbur T.; and Scott, Philip R., to Spectrum Ceramics, Inc. Electronic enclosures having metal parts. 4,572,924, Cl. 174-52.0FP.
Wakeman, Russell J.; Wright, Danny O.; and Peterson, William A., Jr., to Allied Corporation. Air flow sensor. 4,571,996, Cl. 73-202.000.
Wakisaka, Kikuo: *See—*
Kigasawa, Kazuo; Shimizu, Hiroaki; Hayashi, Toshihiro; Watabe, Kazuo; Tanizaki, Akira; Koyama, Osamu; Wakisaka, Kikuo; and Ogawa, Yasuaki, 4,572,832, Cl. 424-19.000.
Walker, Wolfram H.; and Ganshirt, Karlheinz, to Biotest-Serum-Institut GmbH. Aqueous solution for suspending and storing cells, especially erthrocytes. 4,572,899, Cl. 436-18.000.
Wall, Robert G.: *See—*
Duerksen, John H.; Wall, Robert G.; and Knight, Jack D., 4,572,294, Cl. 166-273.000.
Wallace, William D.: *See—*
Cutler, Christopher A.; Wallace, William D.; and Westenskow, Dwayne R., 4,572,208, Cl. 128-718.000.
Walley, David, to Exotek, Inc. Method of selective reduction of the water permeability of subterranean formations. 4,572,295, Cl. 166-295.000.
Wallis, Bernard J. Nitrogen die cylinder. 4,572,489, Cl. 267-119.000.
Wallo, William H., to W. H. Wallo & Associates, Inc. Large capacity display stand for photos and the like. 4,572,379, Cl. 211-57.100.
Walsh, Jean M.: *See—*
Kessler, Laibe A.; and Walsh, Jean M., 4,571,904, Cl. 52-205.000.
Walsh, John J.: *See—*
Timme, William F., 4,571,995, Cl. 73-199.000.
Walter, Lothar; Reith, Walter; and Winkler, Otmar, to SKF Kugellagerfabriken GmbH. Ball bearing arrangement for longitudinal movement on a shaft or the like. 4,572,591, Cl. 308-6.00C.
Walters, Clifford L.: *See—*
Poole, Stephen; West, Stuart I.; and Walters, Clifford L., 4,572,837, Cl. 426-564.000.
Walther, Hans-Joachim, to Dragerwerk Aktiengesellschaft. Control for a protective mask which operates with excess internal pressure. 4,572,176, Cl. 128-204.260.
Walther, Ludwig: *See—*
Hannes, Heinz D.; Lothmann, Josef; and Walther, Ludwig, 4,572,054, Cl. 91-1.000.
Wang Laboratories, Inc.: *See—*
Drumm, Donald E., 4,573,110, Cl. 362-319.000.
Ward, Derek E., to Bergwerksverband GmbH. Nitrogen generator process for the production of low volumes of high purity nitrogen from compressed air. 4,572,723, Cl. 55-25.000.
Ward, John W., to Union Oil Company of California. Hydroprocessing with a large pore catalyst. 4,572,778, Cl. 208-89.000.
Warner-Lambert Technologies, Inc.: *See—*
Collins, Ian P.; and Revell, William J., 4,572,163, Cl. 128-4.000.
Warren, Geoffrey F.; and Cameron, Andrew M., to Shell Internationale Research Maatschappij B.V. Process for producing magnesium. 4,572,736, Cl. 75-10.00R.
Washbourn, Jack, to Westinghouse Brake & Signal Co. Brake system incorporating a stepping motor. 4,572,586, Cl. 303-15.000.
Washington Chain & Supply Company, Inc.: *See—*
Epstein, Irving, 4,572,565, Cl. 294-102.100.
Watabe, Kazuo: *See—*
Kigasawa, Kazuo; Shimizu, Hiroaki; Hayashi, Toshihiro; Watabe, Kazuo; Tanizaki, Akira; Koyama, Osamu; Wakisaka, Kikuo; and Ogawa, Yasuaki, 4,572,832, Cl. 424-19.000.
Watanabe, Hiroshi: *See—*
Tsuzuki, Yu; Watanabe, Hiroshi; and Niwa, Katsuhisa, 4,572,635, Cl. 354-173.100.
Watanabe, Itaru: *See—*
Suga, Masataka; Yamada, Makoto; Takahashi, Kazuhide; Iwasaki, Nobuhiro; Matsui, Kazuyuki; Izawa, Toru; Watanabe, Itaru; and Tagawa, Hisatoshi, 4,572,748, Cl. 148-12.00F.
Watanabe, Kazuhide: *See—*
Takeuchi, Yasuhiro; Sakakibara, Yasuyuki; and Watanabe, Kazuhide, 4,572,136, Cl. 123-447.000.
Watanabe, Noboru: *See—*
Komasaku, Seiichi; Iiyama, Hiroshi; Watanabe, Noboru; and Tanaka, Osamu, 4,571,844, Cl. 33-366.000.
Waters Manufacturing, Inc.: *See—*
Pryputniewicz, Ryszard J.; Clayton, John; and Waters, Robert A., 4,572,599, Cl. 339-5.00R.
Waters, Robert A.: *See—*
Pryputniewicz, Ryszard J.; Clayton, John; and Waters, Robert A., 4,572,599, Cl. 339-5.00R.
Waters, William M., to United States of America, Navy. Dual scan rate radar. 4,573,050, Cl. 343-17.10R.
Watkins, David R., to Union Oil Company of California. Steam injection method. 4,572,296, Cl. 166-303.000.
Watson, Cedric H., to Aquatech, Inc. Cyclonic separator with screen and ball check. 4,572,783, Cl. 210-109.000.
Wavin B.V.: *See—*
Guettouche, Ali; and Lodder, Bernhard, 4,572,523, Cl. 277-207.00A.
Weaver, Harry R.: *See—*
Ammon, J. Preston; Weaver, Harry R.; and Evans, Evan J., 4,572,604, Cl. 339-176.0MP.
Webb, Maurice I.: *See—*
Douglas, Edward; and Webb, Maurice I., 4,572,378, Cl. 209-640.000.
Webb, Stuart F.: *See—*
Embrey, Derek M.; Webb, Stuart F.; and Legg, Graham J., 4,572,987, Cl. 315-77.000.
Weber, Georg: *See—*
Eidenschink, Rudolf; and Weber, Georg, 4,572,794, Cl. 252-299.200.
Weber, Jakob: *See—*
Katscher, Erich; Stoss, Johannes; Weber, Robert; Zoberlein, Dieter; Weber, Jakob; and Forster, Josef, 4,572,284, Cl. 165-95.000.
Weber, Robert: *See—*
Katscher, Erich; Stoss, Johannes; Weber, Robert; Zoberlein, Dieter; Weber, Jakob; and Forster, Josef, 4,572,284, Cl. 165-95.000.
Weber, William E.: *See—*
Koerschner, Lou Anne; Sloumb, Robert C.; and Weber, William E., 4,571,779, Cl. 24-30.50S.
Weeden, Frank G. Lined check valve. 4,572,233, Cl. 137-375.000.
Wegh, John R.: *See—*
Smith, Roger L.; and Wegh, John R., 4,572,336, Cl. 188-72.600.
Wegner, Christian; Schneider, Gottfried; and Mayer, Wolfram, to Bayer Aktiengesellschaft. Polyurethane fixed dressings which harden in the presence of moisture. 4,572,171, Cl. 128-90.000.
Wegner, Paul C., to Tiegel Manufacturing Co. Acid removal from dry charge battery plates. 4,572,746, Cl. 134-10.000.
Wehr Corporation: *See—*
Vanderschaaf, Donald, 4,572,283, Cl. 165-61.000.
Wehrberger, Helmut: *See—*
Nitschke, Christoph; Wehrberger, Helmut; and Menhorn, Hermann, 4,572,929, Cl. 191-29.00R.
Weidler, Charles H., to AMP, Incorporated. Connector for terminating small gauge magnet wire. 4,572,603, Cl. 339-97.00R.
Weil, Wolfgang: *See—*
Opprecht, Paul; and Weil, Wolfgang, 4,572,937, Cl. 219-83.000.
Weimar N.V.: *See—*
Jan ter Bals, Berend, 4,572,354, Cl. 198-592.000.
Weir, Robert M.; and Sommerfeld, Dean R., to Whirlpool Corporation. Method and apparatus for assembling a cabinet for automatic washers. 4,572,596, Cl. 312-257.00R.
Weirich, Walter; and Dettmers, Michael, to Gewerkschaft Eisenhutte Westfalia. Control apparatus. 4,572,709, Cl. 405-302.000.
Weiss, Eugene. Rowing exercise device. 4,572,500, Cl. 272-72.000.
Weiss, Heinz, to Deere & Company. Gearbox for a vehicle. 4,572,026, Cl. 74-700.000.
Weiss, Hermann; and Weiss, Rudolf, to ATEC-Weiss KG. Torque-limiting clutch. 4,572,342, Cl. 192-56.00R.
Weiss, Rudolf: *See—*
Weiss, Hermann; and Weiss, Rudolf, 4,572,342, Cl. 192-56.00R.
Weld-Equip b.v.: *See—*
Tijs, Hendricus C. P., 4,572,940, Cl. 219-86.250.

Welsch, Hans-Jurgen: *See*—
Josuttis, Horst; Meierkord, Ralf; and Welsch, Hans-Jurgen, 4,572,216, Cl. 131-70.000.

Wentzel, Harold G., to Uneek Cap and Coor, Inc. Roller and track means for an overhead door. 4,572,268, Cl. 160-201.000.

Wenz, Herbert; and Becker, Dietmar, to Pfaff Industriemaschinen GmbH. Lubricating system for sewing machines. 4,572,093, Cl. 112-256.000.

Werner, Milton M. No strap saxophone stand. 4,572,050, Cl. 84-385.00A.

West Electric Company, Ltd.: *See*—
Tsuzuki, Yu; Watanabe, Hiroshi; and Niwa, Katsuhisa, 4,572,635, Cl. 354-173.100.

West, Kenneth O., to Mead Corporation, The. Paperboard shipping chock and assembly. 4,572,716, Cl. 410-36.000.

West, Stuart I.: *See*—
Poole, Stephen; West, Stuart I.; and Walters, Clifford L., 4,572,837, Cl. 426-564.000.

Westenskow, Dwayne R.: *See*—
Cutler, Christopher A.; Wallace, William D.; and Westenskow, Dwayne R., 4,572,208, Cl. 128-718.000.

Western Rock Bit Company Limited: *See*—
White, Kenneth M., 4,572,589, Cl. 308-4.00R.

Westheimer, Thomas O.; and Hipson, Peter D. Computer software protection system. 4,573,119, Cl. 364-200.000.

Westinghouse Brake & Signal Co.: *See*—
Washbourn, Jack, 4,572,586, Cl. 303-15.000.

Westinghouse Electric Corp.: *See*—
Driggers, John M.; Saska, Thomas J.; and Kitzes, Arnold S., 4,572,938, Cl. 219-85.0BM.
Eder, Jeffrey S., 4,572,472, Cl. 248-605.000.
Gjertsen, Robert K.; Wilson, John F.; and Shallenberger, John M., 4,572,816, Cl. 376-261.000.
Kao, Yu C.; and Leslie, Scott G., 4,572,947, Cl. 250-211.00J.
Melvin, Waymon A., Jr.; and York, Theodore H., 4,573,170, Cl. 375-100.000.
Oates, Robert M.; Cooper, Herbert C.; and Houser, Kirk D., 4,573,215, Cl. 455-607.000.
Pirl, William E.; and Vogeleer, John P., 4,571,821, Cl. 29-727.000.
Silverblatt, Bernard L., 4,572,817, Cl. 376-409.000.
Spurrier, Francis R., 4,572,876, Cl. 429-34.000.

Westley, Curtis E., to Honeywell Inc. Speed governing and decoupling drive mechanism. 4,572,333, Cl. 185-40.00R.

Weston, Harry, to Hydril Company. Gate valve apparatus and method. 4,572,298, Cl. 166-379.000.

Weston, Harry T.: *See*—
Robinson, McDonald; Weston, Harry T.; and Wong, Yiu H., 4,571,818, Cl. 29-576.00W.

Wetzler, Herbert: *See*—
Krutz, Ferdinand; Keck, Jurgen; Bolingen, Johann; and Wetzler, Herbert, 4,571,848, Cl. 33-544.000.

Wewerka, Peter, to Hoerbiger Pneumatic Gesellschaft mbH. Pneumatic or hydraulic actuation device. 4,572,057, Cl. 92-165.0PR.

Weyerhaeuser Company: *See*—
Muise, Herbert D.; and Hunter, R. Scott, 4,572,424, Cl. 229-39.00R.

Whatley, Roger A., to Motorola, Inc. Fully differential operational amplifier with D.C. common-mode feedback. 4,573,020, Cl. 330-258.000.

Wheatley, William M., to Ram Automotive Company. Nitrous oxide precooler. 4,572,140, Cl. 123-541.000.

Wheelabrator-Frye, Inc.: *See*—
Bullis, F. Barton; and Pokorski, John T., 4,571,894, Cl. 51-426.000.

Wheeler, William K., to W. K. Wheeler, Inc. Handgrip for a crutch. 4,572,227, Cl. 135-72.000.

Whelan, Patrick: *See*—
van Loveren, Augustinus G.; Sprecker, Mark A.; Whelan, Patrick; and Hanna, Marie R., 4,572,796, Cl. 252-522.00R.

Wheless, Jack C.; and Dickerson, Richie H., to Philip Morris Incorporated. Apparatus for packing oval cigarettes. 4,571,917, Cl. 53-148.000.

Whight, Kenneth R., to U.S. Philips Corporation. Breakdown voltage increasing device with multiple floating annular guard rings of decreasing lateral width. 4,573,066, Cl. 357-52.000.

Whipple, David P.: *See*—
Curtis, G. Stephen; and Whipple, David P., 4,573,026, Cl. 332-18.000.

Whirlpool Corporation: *See*—
Weir, Robert M.; and Sommerfeld, Dean R., 4,572,596, Cl. 312-257.00R.

White, Anthony M.: *See*—
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White, Donald M., III, to Toro Company, The. Cutting head for filament trimmer. 4,571,831, Cl. 30-276.000.

White, Kenneth M., to Western Rock Bit Company Limited. Journal bearing. 4,572,589, Cl. 308-4.00R.

White, Paul R., to United States of America, National Aeronautics and Space Administration. Fluid flow meter for measuring the rate of fluid flow in a conduit. 4,572,004, Cl. 73-861.580.

White, Stanley A., to Rockwell International Corporation. Signal processor for compensating detector non-uniformities. 4,573,133, Cl. 364-571.000.

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Wiesner, Hagen-Heinz; and Mattern, Heinz E., to Diehl GmbH & Co. Connecting elements for crawler track vehicle chains pursuant to the dually-hinged pin principle. 4,572,588, Cl. 305-58.0PC.

Wiessner, Willi: *See*—
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Wigwam Mills, Inc.: *See*—
Chesebro, Robert E., Jr.; and Aigner, Philip C., 4,571,959, Cl. 66-169.00R.

Wild, Rudolf, to Indag Gesellschaft fur Industriebedarf mbH. Machinery and method for attaching drinking straws in protective coverings to beverage containers. 4,572,758, Cl. 156-256.000.

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Williams, Derrick G.; Thurlow, John; and Bushnell, John J., to Oleo International Holdings Limited. Movable stops for railway vehicles. 4,572,080, Cl. 104-252.000.

Williams, Gery R.; and Spector, George. Push button automatic open and close umbrella. 4,572,226, Cl. 135-22.000.

Williams, Grahame F.: *See*—
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Williams, L. Benton. Molding cast system for fractures of the humerus and of the radius ulna. 4,572,172, Cl. 128-94.000.

Williams, Marvin E., to Huntington National Bank, The. Information organizing device. 4,571,867, Cl. 40-405.000.

Williams, O. Franklin, Jr., to PPG Industries, Inc. Pinch means for attenuating float glass and method of using same. 4,572,731, Cl. 65-99.500.

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Winston, John H., to Outboard Marine Corporation. Lost foam pattern assembly equipment. 4,572,762, Cl. 156-556.000.

Wior, Carol W., to Wior Corporation. Swimsuit. 4,571,742, Cl. 2-67.000.

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Withers, Ernest A., Jr. Quick release hacksaw blade tensioning device. 4,571,829, Cl. 30-144.000.

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Wohltjen, Henry, to United States of America, Navy. Organic semiconductor vapor sensing method. 4,572,900, Cl. 436-151.000.

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Yamada, Yuji, to Trio Kabushiki Kaisha. Current mirror circuit. 4,573,019, Cl. 330-257.000.

Yamaguchi, Noboru; and Ito, Kiichiro, to Nissan Motor Co., Ltd.; and Kato Hatsujo Kaisha Limited. Harness clip. 4,572,466, Cl. 248-73.000.

Yamaguchi, Shingo, to Ricoh Company, Ltd. Sensor array driving circuit. 4,573,079, Cl. 358-213.000.

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Yamamura, Shinichi, to Sony Corporation. Circuit for detecting existence of an information signal. 4,572,965, Cl. 307-130.000.

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Yamanoue, Kouichi: *See*—
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Yoshimi, Tomohisa; and Takeo, Yuji, to Nippondenso Co., Ltd. Pulsimeter for vehicles. 4,572,207, Cl. 128-706.000.

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Yoshitomi-Pharmaceutical Ind., Ltd.: *See*—
Satake, Toshimi; Minami, Toshiaki; Fujimura, Fumio; Oda, Satoshi; and Magami, Masato, 4,573,062, Cl. 346-209.000.

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Yuge, Shizuo; Oka, Tateki; Sakakibara, Susumu; and Toyoshi, Naoki, to Minolta Camera Kabushiki Kaisha. Method of controlling replenishment of toners. 4,572,102, Cl. 118-689.000.

Yung-Kuan, Wei Y. Coffee boiler with an automatic feeding device. 4,572,060, Cl. 99-280.000.

Yura, Shigetsugu: *See*—
Takagi, Sadaaki; Yura, Shigetsugu; and Fukuda, Masaki, 4,572,430, Cl. 237-2.00A.

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Zanno, Paul R.; Barnett, Ronald E.; and Roy, Glenn M., to General Foods Corporation. L-Aminodicarboxylic acid amides. 4,572,799, Cl. 260-112.50R.

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Zehntel, Inc.: *See*—
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Zeikus, Joseph G., to Genentech, Inc. Thermophile isolate having thermostable hydrolytic activity. 4,572,898, Cl. 435-200.000.

Zeitel, Joachim, to Maschinenfabrik Alfred Schmermund GmbH & Co. Apparatus for forming cigarette groups. 4,571,918, Cl. 53-149.000.

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Zimmer, Max: *See*—
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Zola, John, to North American Philips Corporation. Transducer comprising composite electrical materials. 4,572,981, Cl. 310-357.000.

Zolecki, Donald L. Head restraining device for cervical support brace. 4,571,757, Cl. 5-82.00R.

Zscheile, John W., Jr.: *See*—
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Zuchtriegel, Anton, to Patent-Treuhand Gesellschaft fur electrische Gluhlampen mbH. Rapid-start, low-pressure discharge lamp operating circuit. 4,572,989, Cl. 315-209.00R.

Zulehner, Werner: *See*—
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501 Ainsworth Nominees Pty. Limited: *See*—
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501 Telecommunications Radioelectriques et Telephoniques T.R.T.: *See*—
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LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 25TH DAY OF FEBRUARY, 1986

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

BASF Aktiengesellschaft: *See*—
Hamprecht, Gerhard; and Wuerzer, Bruno, Re. 32,087, Cl. 71-88.000.

General Electric Company: *See*—
Sip, Jiri G., Re. 32,088, Cl. 362-368.000.

Haggard, Archie K., to Haggard I. D. Wiper, Inc. Tubular member interior wiper. Re. 32,085, Cl. 166-170.000.

Haggard I. D. Wiper, Inc.: *See*—
Haggard, Archie K., Re. 32,085, Cl. 166-170.000.

Hamprecht, Gerhard; and Wuerzer, Bruno, to BASF Aktiengesellschaft. 4H-3,1-Benzoxazine derivatives. Re. 32,087, Cl. 71-88.000.

Sip, Jiri G., to General Electric Company. Snap in coupling assembly for a vehicle headlamp. Re. 32,088, Cl. 362-368.000.

Spirig, Ernst. Solder removing device. Re. 32,086, Cl. 228-19.000.

Wuerzer, Bruno: *See*—
Hamprecht, Gerhard; and Wuerzer, Bruno, Re. 32,087, Cl. 71-88.000.

LIST OF REEXAMINATION PATENTEES

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CERTIFICATES WERE ISSUED

Albertson, E.: *See*—
Fitch, Elliot B.; and Albertson, E., B1 4,232,614, Cl. 110-235.000.

Callihan, Patrick R.: *See*—
Farr, Garth M.; and Callihan, Patrick R., B1 4,445,402, Cl. 81-57.160.

Conner, Jesse R., to National Environmental Controls, Inc. Method of making wastes non-polluting and disposable. B1 3,837,872, 2-25-86, Cl. 106-74.000.

Dorr-Oliver Incorporated: *See*—
Fitch, Elliot B.; and Albertson, E., B1 4,232,614, Cl. 110-235.000.

Farr, Garth M.; and Callihan, Patrick R., to Farr Oil Tool, Inc. Power tong and back-up tong assembly. B1 4,445,402, 2-25-86, Cl. 81-57.160.

Farr Oil Tool, Inc.: *See*—
Farr, Garth M.; and Callihan, Patrick R., B1 4,445,402, Cl. 81-57.160.

Fitch, Elliot B.; and Albertson, E., to Dorr-Oliver Incorporated. Process of incineration with predrying of moist feed using hot inert particulates. B1 4,232,614, 2-25-86, Cl. 110-235.000.

National Environmental Controls, Inc.: *See*—
Conner, Jesse R., B1 3,837,872, Cl. 106-74.000.

Rothfuss, Robert G., to Senmed, Inc. Intralumenal anastomosis surgical stapling instrument. B1 4,319,576, 2-25-86, Cl. 128-305.000.

Senmed, Inc.: *See*—
Rothfuss, Robert G., B1 4,319,576, Cl. 128-305.000.

LIST OF DESIGN PATENTEES

Albrecht, Douglas A.; Townsend, Donald L.; and Underwood, Roger N., to Enterprise Coffee & Supply Company. Coffee maker. 282,709, 2-25-86, Cl. D7-309.000.

Alfa Romeo Auto S.p.A.: *See*—
Giavazzi, Carlo; Villa, Ezio; and Dimora, Leonardo, 282,733, Cl. D12-195.000.

Allen, Cyndy. Baby carrier. 282,697, 2-25-86, Cl. D3-31.000.

Allen, Davis B., to Skidmore, Owings & Merrill. Chair. 282,703, 2-25-86, Cl. D6-370.000.

Anderson, Gary D. Window pulley seal. 282,717, 2-25-86, Cl. D8-349.000.

Anscomb, Timothy, to Schering - Prebbles Limited. Bottle. 282,719, 2-25-86, Cl. D9-373.000.

Aqua-Leisure Industries, Inc.: *See*—
Fireman, Simon C., 282,718, Cl. D9-337.000.

Arthur, James R., Jr., to Marathon Corporation. Chair frame. 282,699, 2-25-86, Cl. D6-373.000.

Arthur, James R., Jr., to Marathon Corporation. Chair frame. 282,700, 2-25-86, Cl. D6-373.000.

Artsana S.p.A.: *See*—
Catelli, Pietro, 282,760, Cl. D21-63.000.
Catelli, Pietro, 282,762, Cl. D21-109.000.
Catelli, Pietro, 282,763, Cl. D21-111.000.

Asian Star U.S.A., Inc.: *See*—
Chiang, Hsin-Hui, 282,692, Cl. D2-252.000.

Ball-Sash, Inc.: *See*—
Gault, Christian, 282,694, Cl. D2-381.000.

Baum, Elliot I., to QT&T, Inc. Two piece telephone. 282,742, 2-25-86, Cl. D14-53.000.

Bayerische Motoren Werke AG: *See*—
Luthe, Claus, 282,732, Cl. D12-167.000.

Borg, Luke, to Fibre Containers Limited. Carton. 282,720, 2-25-86, Cl. D9-418.000.

Brayer, Randall R.; and Pillsbury, Leon W., Jr., to Goodyear Tire & Rubber Company, The. Shoe sole. 282,693, 2-25-86, Cl. D2-320.000.

Breslow, Jeffrey D.: *See*—
Rivette, Denni F.; and Breslow, Jeffrey D., 282,741, Cl. D14-53.000.

Bridge, Norman H.: *See*—
Flory, Robert; and Bridge, Norman H., 282,713, Cl. D8-31.000.

Bridge Products, Inc.: *See*—
Flory, Robert; and Bridge, Norman H., 282,713, Cl. D8-31.000.

Brother Kogyo Kabushiki Kaisha: *See*—
Inazuka, Hirozi, 282,750, Cl. D18-24.000.

Brown, Paul R. Telephone. 282,736, 2-25-86, Cl. D14-53.000.

Brown, Wilbert C., to TIE/Communications, Inc. Direct station selection console. 282,745, 2-25-86, Cl. D14-58.000.

Bulgari, Marina, to Marina B Creation S.A. Necklace. 282,727, 2-25-86, Cl. D11-3.000.

Burnett, Rex A. Plant holder. 282,704, 2-25-86, Cl. D6-556.000.

Camens, Murray I. C., to U.S. Philips Corporation. Digital electronic blood pressure meter. 282,778, 2-25-86, Cl. D24-21.000.

Cameron, Warde M., Jr., to Warner-Lambert Company. Towel tray. 282,721, 2-25-86, Cl. D9-425.000.

Canyon Corporation: *See*—
Tada, Tetsuya, 282,770, Cl. D23-17.000.

Carlson, Richard E.: *See*—
Johnson, Logan W.; Carlson, Richard E.; McCadden, Michael E.; Offerdahl, Richard E.; and Van Brunt, Nicholas P., 282,746, Cl. D14-102.000.

Catelli, Pietro, to Artsana S.p.A. Activity toy. 282,760, 2-25-86, Cl. D21-63.000.

Catelli, Pietro, to Artsana S.p.A. Play case for a toy doctor kit or similar article. 282,762, 2-25-86, Cl. D21-109.000.

Catelli, Pietro, to Artsana S.p.A. Combined toy telephone and desk. 282,763, 2-25-86, Cl. D21-111.000.

Chap, John P., to Selfix, Inc. Wall mounted rack. 282,705, 2-25-86, Cl. D6-566.000.

Chiang, Hsin-Hui, to Asian Star U.S.A., Inc. Sun visor or similar article. 282,692, 2-25-86, Cl. D2-252.000.

Cho, Saeng K. Combined match and holder for a cigarette. 282,786, 2-25-86, Cl. D27-30.000.
Christen, Hans D.; and Robertson, David E., to Rain Bird Sprinkler Mfg. Corp. Sprinkler drive arm. 282,768, 2-25-86, Cl. D23-7.000.
Cohen, Joseph. Combined pen holder and desk tray. 282,755, 2-25-86, Cl. D19-78.000.
Cohen, Joseph. Card holder. 282,757, 2-25-86, Cl. D19-86.000.
Collister, Kenneth D.; and Johnson, Steven C., to Miles Laboratories, Inc. Spectro photometer. 282,724, 2-25-86, Cl. D10-46.000.
Cone-A-Copia, Inc.: *See—*
Lebo, William H., 282,748, Cl. D15-82.000.
Danniger, Nancy R. Ornamental scarf pin. 282,695, 2-25-86, Cl. D2-405.000.
Danniger, Nancy R. Ornamental scarf pin. 282,696, 2-25-86, Cl. D2-407.000.
Dietz, Hugh H.; Latham, Daniel S.; and Tienken, Alfred G., to Dietz, R. E. Reflector. 282,726, 2-25-86, Cl. D10-111.000.
Dietz, R. E.: *See—*
Dietz, Hugh H.; Latham, Daniel S.; and Tienken, Alfred G., 282,726, Cl. D10-111.000.
DiFede, Dominic J. Pot or pan restraint for engaging the radial bars of recreational vehicle stove top gratings. 282,706, 2-25-86, Cl. D7-70.000.
Dimora, Leonardo: *See—*
Giavazzi, Carlo; Villa, Ezio; and Dimora, Leonardo, 282,733, Cl. D12-195.000.
Domom, Yoshihiro: *See—*
Fujita, Toshiharu; Takizawa, Fuminobu; and Domom, Yoshihiro, 282,784, Cl. D26-3.000.
Enterprise Coffee & Supply Company: *See—*
Albrecht, Douglas A.; Townsend, Donald L.; and Underwood, Roger N., 282,709, Cl. D7-309.000.
ESPE Fabrik pharmazeutischer Praeparate GmbH: *See—*
Neumeister, Alexander, 282,776, Cl. D24-10.000.
Exxon Research and Engineering Co.: *See—*
Gardner, William R.; and Parenteau, Paul G., 282,751, Cl. D18-24.000.
Fibre Containers Limited: *See—*
Borg, Luke, 282,720, Cl. D9-418.000.
Fireman, Simon C., to Aqua-Leisure Industries, Inc. Swimgear package. 282,718, 2-25-86, Cl. D9-337.000.
Fleury, William A. Aspirator fitting. 282,772, 2-25-86, Cl. D23-43.000.
Flory, Robert; and Bridge, Norman H., to Bridge Products, Inc. Tire repair tool. 282,713, 2-25-86, Cl. D8-31.000.
Floyd, Charlton A., Sr., to J. A. Preston Corporation. Platform for rehabilitation exercise and therapy. 282,775, 2-25-86, Cl. D24-3.000.
Fujita, Toshiharu; Takizawa, Fuminobu; and Domom, Yoshihiro, to Mitsubishi Denki Kabushiki Kaisha. Fluorescent lamp. 282,784, 2-25-86, Cl. D26-3.000.
Gardner, William R.; and Parenteau, Paul G., to Exxon Research and Engineering Co. Font of type. 282,751, 2-25-86, Cl. D18-24.000.
Garrison, Billy E., to Lockheed Corporation. Shot peen discharge nozzle. 282,771, 2-25-86, Cl. D23-34.000.
Gault, Christian, to Ball-Sash, Inc. Belt-type garment for carrying tennis balls. 282,694, 2-25-86, Cl. D2-381.000.
General Research of Electronics, Inc.: *See—*
Imazeki, Kazuyoshi, 282,725, Cl. D10-104.000.
Giavazzi, Carlo; Villa, Ezio; and Dimora, Leonardo, to Alfa Romeo Auto S.p.A. Combined interior roof lining, rear view mirror, sun visors and overhead console for an automobile. 282,733, 2-25-86, Cl. D12-195.000.
Goodyear Tire & Rubber Company, The: *See—*
Brayer, Randall R.; and Pillsbury, Leon W., Jr., 282,693, Cl. D2-320.000.
Gresham, David M.; Kelley, Ted F.; Yenerich, Philip C.; and Zapfe, Roland, to International Business Machines Corporation. Tape drive. 282,747, 2-25-86, Cl. D14-108.000.
Gretz, Charles; and Kandel, Gerald J., to Life-Like Products, Inc. Portable insulated chest. 282,707, 2-25-86, Cl. D7-77.000.
Harvey, Frank T. Combination pull tab can and bottle opener. 282,714, 2-25-86, Cl. D8-113.000.
Heinis, Robert; and Podlesny, Daniel, to Red Devil, Inc. Combined hanger and handle for hand tools. 282,716, 2-25-86, Cl. D8-107.000.
Herold, Gerald C.: *See—*
LeBlanc, Jacques; Herold, Gerald C.; and Thompson, E. Dale, 282,754, Cl. D19-49.000.
Hirsch, Karl, to Karl Hirsch Kunststofftechnik. Hanging file binder. 282,758, 2-25-86, Cl. D19-91.000.
Honda Giken Kogyo Kabushiki Kaisha: *See—*
Shibuya, Toshihiko, 282,734, Cl. D13-1.000.
Huang, Lobo, to Karlee Enterprises, Inc. Telephone. 282,737, 2-25-86, Cl. D14-53.000.
Huang, Lobo, to Karlee Enterprises, Inc. Telephone. 282,743, 2-25-86, Cl. D14-53.000.
Huang, Lobo, to Karlee Enterprises, Inc. Telephone. 282,744, 2-25-86, Cl. D14-53.000.
Imazeki, Kazuyoshi, to General Research of Electronics, Inc. Radar detector. 282,725, 2-25-86, Cl. D10-104.000.
Inazuka, Hirozi, to Brother Kogyo Kabushiki Kaisha. Typeface. 282,750, 2-25-86, Cl. D18-24.000.
International Business Machines Corporation: *See—*
Gresham, David M.; Kelley, Ted F.; Yenerich, Philip C.; and Zapfe, Roland, 282,747, Cl. D14-108.000.
J. A. Preston Corporation: *See—*
Floyd, Charlton A., Sr., 282,775, Cl. D24-3.000.
John Manufacturing Limited: *See—*
Yuen, John S., 282,785, Cl. D26-42.000.
Johnson, Logan W.; Carlson, Richard E.; McCadden, Michael E.; Offerdahl, Richard E.; and Van Brunt, Nicholas P., to Zycad Corporation. Special purpose computer housing. 282,746, 2-25-86, Cl. D14-102.000.
Johnson, Steven C.: *See—*
Collister, Kenneth D.; and Johnson, Steven C., 282,724, Cl. D10-46.000.
Juaire, Phillip R.; Wagner, Fredric M.; and Wildgen, Leo F., to Satellite Industries, Inc. Combined building wall and door unit. 282,782, 2-25-86, Cl. D25-48.000.
Kain, James M., to Questor Corp. Stroller handle. 282,731, 2-25-86, Cl. D12-133.000.
Kandel, Gerald J.: *See—*
Gretz, Charles; and Kandel, Gerald J., 282,707, Cl. D7-77.000.
Karl Hirsch Kunststofftechnik: *See—*
Hirsch, Karl, 282,758, Cl. D19-91.000.
Karlee Enterprises, Inc.: *See—*
Huang, Lobo, 282,737, Cl. D14-53.000.
Huang, Lobo, 282,743, Cl. D14-53.000.
Huang, Lobo, 282,744, Cl. D14-53.000.
Kelley, Ted F.: *See—*
Gresham, David M.; Kelley, Ted F.; Yenerich, Philip C.; and Zapfe, Roland, 282,747, Cl. D14-108.000.
Kino, Moriya. Toy whistle. 282,761, 2-25-86, Cl. D21-64.000.
Kurz, Craven H. Orthodontic ligature wire cutter. 282,777, 2-25-86, Cl. D24-10.000.
Latham, Daniel S.: *See—*
Dietz, Hugh H.; Latham, Daniel S.; and Tienken, Alfred G., 282,726, Cl. D10-111.000.
Laukamo Oy: *See—*
Salovaara, Juhani, 282,739, Cl. D14-53.000.
LeBlanc, Jacques, to Parker Pen Company, The. Writing instrument with a striped body. 282,753, 2-25-86, Cl. D19-49.000.
LeBlanc, Jacques; Herold, Gerald C.; and Thompson, E. Dale, to Parker Pen Company, The. Writing instrument with faceted trim rings. 282,754, 2-25-86, Cl. D19-49.000.
Lebo, William H., to Cone-A-Copia, Inc. Ice cream dispensing machine. 282,748, 2-25-86, Cl. D15-82.000.
Lemkin, Jack L.; and Peterson, Carl A., to O. M. Scott & Sons Company. Oscillator sprinkler. 282,769, 2-25-86, Cl. D23-8.000.
Life-Like Products, Inc.: *See—*
Gretz, Charles; and Kandel, Gerald J., 282,707, Cl. D7-77.000.
Lockheed Corporation: *See—*
Garrison, Billy E., 282,771, Cl. D23-34.000.
Lott, Timothy R. Cover for needle and syringe disposal container or the like. 282,722, 2-25-86, Cl. D9-435.000.
Lowder, Eldon L. Colonic irrigation board. 282,781, 2-25-86, Cl. D24-51.000.
Lunn, Royston C., to Renault/Jeep Sport, Inc. Single seat sports car. 282,729, 2-25-86, Cl. D12-88.000.
Luthe, Claus, to Bayerische Motoren Werke AG. Elastomer rear bumper guard for automobiles. 282,732, 2-25-86, Cl. D12-167.000.
MacNeal, Paul D. Clock. 282,723, 2-25-86, Cl. D10-21.000.
Manning, Arthur T. Vice clamp. 282,715, 2-25-86, Cl. D8-72.000.
Marathon Corporation: *See—*
Arthur, James R., Jr., 282,699, Cl. D6-373.000.
Arthur, James R., Jr., 282,700, Cl. D6-373.000.
Marina B Creation S.A.: *See—*
Bulgari, Marina, 282,727, Cl. D11-3.000.
Marvin Glass & Associates: *See—*
Rivette, Denni F.; and Breslow, Jeffrey D., 282,741, Cl. D14-53.000.
Mase, Nobuyuki; and Mori, Daisaku, to Matsushita Electric Industrial Co., Ltd. Oil heater. 282,773, 2-25-86, Cl. D23-121.000.
Matsushita Electric Industrial Co., Ltd.: *See—*
Mase, Nobuyuki; and Mori, Daisaku, 282,773, Cl. D23-121.000.
Maus, Steven M. Drink container holder. 282,702, 2-25-86, Cl. D6-573.000.
McCadden, Michael E.: *See—*
Johnson, Logan W.; Carlson, Richard E.; McCadden, Michael E.; Offerdahl, Richard E.; and Van Brunt, Nicholas P., 282,746, Cl. D14-102.000.
McMurtrey, David K.: *See—*
Pawsat, Carlton P.; and McMurtrey, David K., 282,730, Cl. D12-125.000.
Megargee, Theresa M. Toy gun. 282,764, 2-25-86, Cl. D21-147.000.
Miles Laboratories, Inc.: *See—*
Collister, Kenneth D.; and Johnson, Steven C., 282,724, Cl. D10-46.000.
Mitsubishi Denki Kabushiki Kaisha: *See—*
Fujita, Toshiharu; Takizawa, Fuminobu; and Domom, Yoshihiro, 282,784, Cl. D26-3.000.
Mori, Daisaku: *See—*
Mase, Nobuyuki; and Mori, Daisaku, 282,773, Cl. D23-121.000.
Nakamura, Kazuharu, to Toyotomi Kogyo Co., Ltd. Oil-fired space heater. 282,774, 2-25-86, Cl. D23-123.000.
Nelson, Marlyn N. O. Garden marker stake. 282,711, 2-25-86, Cl. D8-1.000.
Neumeister, Alexander, to ESPE Fabrik pharmazeutischer Praeparate GmbH. Device for metered dispensing of dental compounds. 282,776, 2-25-86, Cl. D24-10.000.
Newton, John J., Jr., to Sage Products, Inc. Mouth care brush. 282,698, 2-25-86, Cl. D4-104.000.

Nichols, Henry L. Combined cart and bowling ball bag. 282,787, 2-25-86, Cl. D34-25.000.
Nichols, Stephen A., to Uniden Corporation of America. Cordless telephone handset. 282,738, 2-25-86, Cl. D14-53.000.
Nightingale, Walter H. Insect trap. 282,766, 2-25-86, Cl. D22-19.000.
O. M. Scott & Sons Company: *See—*
Lemkin, Jack L.; and Peterson, Carl A., 282,769, Cl. D23-8.000.
Offerdahl, Richard E.: *See—*
Johnson, Logan W.; Carlson, Richard E.; McCadden, Michael E.; Offerdahl, Richard E.; and Van Brunt, Nicholas P., 282,746, Cl. D14-102.000.
Olivetti, Mary P. Artist brush holder. 282,752, 2-25-86, Cl. D19-26.000.
Owen, John J., III. Flash exposure device. 282,749, 2-25-86, Cl. D16-38.000.
Parenteau, Paul G.: *See—*
Gardner, William R.; and Parenteau, Paul G., 282,751, Cl. D18-24.000.
Parker Pen Company, The: *See—*
LeBlanc, Jacques, 282,753, Cl. D19-49.000.
LeBlanc, Jacques; Herold, Gerald C.; and Thompson, E. Dale, 282,754, Cl. D19-49.000.
Pawsat, Carlton P.; and McMurtrey, David K., to Wald Manufacturing Co., Inc. Bicycle pedal tread. 282,730, 2-25-86, Cl. D12-125.000.
Peterson, Carl A.: *See—*
Lemkin, Jack L.; and Peterson, Carl A., 282,769, Cl. D23-8.000.
Pillsbury, Leon W., Jr.: *See—*
Brayer, Randall R.; and Pillsbury, Leon W., Jr., 282,693, Cl. D2-320.000.
Podlesny, Daniel: *See—*
Heinis, Robert; and Podlesny, Daniel, 282,716, Cl. D8-107.000.
PPM, Inc.: *See—*
Shofner, Frederick M., 282,767, Cl. D23-4.000.
QT&T, Inc.: *See—*
Baum, Elliot I., 282,742, Cl. D14-53.000.
Questor Corp.: *See—*
Kain, James M., 282,731, Cl. D12-133.000.
Rademacher, George. Arm for rescue tool. 282,712, 2-25-86, Cl. D8-14.000.
Rain Bird Sprinkler Mfg. Corp.: *See—*
Christen, Hans D.; and Robertson, David E., 282,768, Cl. D23-7.000.
Red Devil, Inc.: *See—*
Heinis, Robert; and Podlesny, Daniel, 282,716, Cl. D8-107.000.
Reece, Frederick W. Headset for esophageal gastric tube. 282,780, 2-25-86, Cl. D24-34.000.
Rel, Vladimir. Ear stud gun. 282,779, 2-25-86, Cl. D24-23.000.
Renault/Jeep Sport, Inc.: *See—*
Lunn, Royston C., 282,729, Cl. D12-88.000.
Rezewski, Paul. Extruded insulated moulding for a storm door. 282,783, 2-25-86, Cl. D25-74.000.
Rivette, Denni F.; and Breslow, Jeffrey D., to Marvin Glass & Associates. Telephone set. 282,741, 2-25-86, Cl. D14-53.000.
Robertson, David E.: *See—*
Christen, Hans D.; and Robertson, David E., 282,768, Cl. D23-7.000.
Rood, Robert M. Telephone set. 282,740, 2-25-86, Cl. D14-53.000.
Sage Products, Inc.: *See—*
Newton, John J., Jr., 282,698, Cl. D4-104.000.
Salovaara, Juhani, to Laukamo Oy. Handset telephone. 282,739, 2-25-86, Cl. D14-53.000.
Sass, Carl N. Pen holder. 282,756, 2-25-86, Cl. D19-82.000.
Satellite Industries, Inc.: *See—*
Juaire, Phillip R.; Wagner, Fredric M.; and Wildgen, Leo F., 282,782, Cl. D25-48.000.
Schaeffer, Mary A., to Vollrath Company, The. Ladle. 282,708, 2-25-86, Cl. D7-104.000.
Schering - Prebbles Limited: *See—*
Anscomb, Timothy, 282,719, Cl. D9-373.000.
Selfix, Inc.: *See—*
Chap, John P., 282,705, Cl. D6-566.000.
Shibuya, Toshihiko, to Honda Giken Kogyo Kabushiki Kaisha. Engine generator. 282,734, 2-25-86, Cl. D13-1.000.
Shipman, Ronald P. Blow gun. 282,765, 2-25-86, Cl. D22-3.000.
Shofner, Frederick M., to PPM, Inc. Filter unit. 282,767, 2-25-86, Cl. D23-4.000.
Skidmore, Owings & Merrill: *See—*
Allen, Davis B., 282,703, Cl. D6-370.000.
Spade, Angela M. Necklace or similar article. 282,728, 2-25-86, Cl. D11-6.000.
Tada, Tetsuya, to Canyon Corporation. Combined pump and nozzle for sprayer. 282,770, 2-25-86, Cl. D23-17.000.
Takizawa, Fuminobu: *See—*
Fujita, Toshiharu; Takizawa, Fuminobu; and Domom, Yoshihiro, 282,784, Cl. D26-3.000.
Thompson, E. Dale: *See—*
LeBlanc, Jacques; Herold, Gerald C.; and Thompson, E. Dale, 282,754, Cl. D19-49.000.
TIE/Communications, Inc.: *See—*
Brown, Wilbert C., 282,745, Cl. D14-58.000.
Tienken, Alfred G.: *See—*
Dietz, Hugh H.; Latham, Daniel S.; and Tienken, Alfred G., 282,726, Cl. D10-111.000.
Tizzard, Thomas J. Telephone set. 282,735, 2-25-86, Cl. D14-53.000.
Tomex Limited: *See—*
Tomlin, Norman E., 282,701, Cl. D6-405.000.
Tomlin, Norman E., to Tomex Limited. Pot holder. 282,701, 2-25-86, Cl. D6-405.000.
Townsend, Donald L.: *See—*
Albrecht, Douglas A.; Townsend, Donald L.; and Underwood, Roger N., 282,709, Cl. D7-309.000.
Toyotomi Kogyo Co., Ltd.: *See—*
Nakamura, Kazuharu, 282,774, Cl. D23-123.000.
Underwood, Roger N.: *See—*
Albrecht, Douglas A.; Townsend, Donald L.; and Underwood, Roger N., 282,709, Cl. D7-309.000.
Uniden Corporation of America: *See—*
Nichols, Stephen A., 282,738, Cl. D14-53.000.
U.S. Philips Corporation: *See—*
Camens, Murray I. C., 282,778, Cl. D24-21.000.
Van Brunt, Nicholas P.: *See—*
Johnson, Logan W.; Carlson, Richard E.; McCadden, Michael E.; Offerdahl, Richard E.; and Van Brunt, Nicholas P., 282,746, Cl. D14-102.000.
Villa, Ezio: *See—*
Giavazzi, Carlo; Villa, Ezio; and Dimora, Leonardo, 282,733, Cl. D12-195.000.
Vollrath Company, The: *See—*
Schaeffer, Mary A., 282,708, Cl. D7-104.000.
Vosbikian, Mike. Garden tool handle. 282,710, 2-25-86, Cl. D8-1.000.
Wagner, Fredric M.: *See—*
Juaire, Phillip R.; Wagner, Fredric M.; and Wildgen, Leo F., 282,782, Cl. D25-48.000.
Wald Manufacturing Co., Inc.: *See—*
Pawsat, Carlton P.; and McMurtrey, David K., 282,730, Cl. D12-125.000.
Warner-Lambert Company: *See—*
Cameron, Warde M., Jr., 282,721, Cl. D9-425.000.
Weissberg, Gary S. Video game control unit. 282,759, 2-25-86, Cl. D21-48.000.
Wildgen, Leo F.: *See—*
Juaire, Phillip R.; Wagner, Fredric M.; and Wildgen, Leo F., 282,782, Cl. D25-48.000.
Yenerich, Philip C.: *See—*
Gresham, David M.; Kelley, Ted F.; Yenerich, Philip C.; and Zapfe, Roland, 282,747, Cl. D14-108.000.
Yuen, John S., to John Manufacturing Limited. Combined multi-purpose fluorescent lantern and emergency light. 282,785, 2-25-86, Cl. D26-42.000.
Zapfe, Roland: *See—*
Gresham, David M.; Kelley, Ted F.; Yenerich, Philip C.; and Zapfe, Roland, 282,747, Cl. D14-108.000.
Zycad Corporation: *See—*
Johnson, Logan W.; Carlson, Richard E.; McCadden, Michael E.; Offerdahl, Richard E.; and Van Brunt, Nicholas P., 282,746, Cl. D14-102.000.

LIST OF PLANT PATENTEES

Armstrong Nurseries, Inc.: *See—*
Christensen, Jack E., 5,672, Cl. 10.000.
Delbard, Georges A., 5,673, Cl. 17.000.
Bennett, Cecilia L. D. Miniature rose plant. 5,670, 2-25-86, Cl. 9.000.
Christensen, Jack E., to Armstrong Nurseries, Inc. Hybrid miniature moss rose plant cv. Aromikeh. 5,672, 2-25-86, Cl. 10.000.
Delbard, Georges A., to Armstrong Nurseries, Inc. Hybrid tea rose plant cv. Delmator. 5,673, 2-25-86, Cl. 17.000.
Hope, Claude, to Pan American Plant Company. Kalanchoe plant named Monteray. 5,675, 2-25-86, Cl. 68.000.
Insakuma, Grace, executrix: *See—*
Schwartze, Chester S.; and Sakuma, Atsusa, deceased, 5,674, Cl. 49.000.
Pan American Plant Company: *See—*
Hope, Claude, 5,675, Cl. 68.000.
Sakuma, Atsusa, deceased: *See—*
Schwartze, Chester S.; and Sakuma, Atsusa, deceased, 5,674, Cl. 49.000.
Sakuma Bros. Farms, Inc.: *See—*
Schwartze, Chester S.; and Sakuma, Atsusa, deceased, 5,674, Cl. 49.000.
Schwartze, Chester S.; and Sakuma, Atsusa, deceased (by Insakuma, Grace, executrix), to Sakuma Bros. Farms, Inc. Strawberry plant-Burlington. 5,674, 2-25-86, Cl. 49.000.
Williams, Ernest D. Miniature rose plant 'Minkco'. 5,671, 2-25-86, Cl. 10.000.

CLASSIFICATION OF PATENTS

ISSUED FEBRUARY 25, 1986

NOTE.—First number, class; second number, subclass; third number, patent number

CLASS 2

8 4,571,741
67 4,571,742
88 4,571,743
111 4,571,744
139 4,571,745
209 4,571,746
424 4,571,747
436 4,571,748

CLASS 4

288 4,571,751
300 4,571,752
324 4,571,753
480 4,571,754

CLASS 5

13 4,571,755
53 R 4,571,756
82 R 4,571,757
86 4,571,758
90 4,571,759
99 R 4,571,760
431 4,571,761
451 4,571,762
464 4,571,763

CLASS 7

107 4,571,764

CLASS 8

94.1 R 4,572,721
149.3 4,571,765

CLASS 15

105 4,571,766
161 4,571,767
167 R 4,571,768
230.11 4,571,769
250.42 4,571,770
319 4,571,771
335 4,571,772

CLASS 16

85 4,571,773
237 4,571,774
298 4,571,775
339 4,571,776

CLASS 17

1 E 4,571,777
54 4,571,778

CLASS 24

30.5 S 4,571,779
95 4,571,780
4,571,781
141 4,571,782
200 4,571,783
433 4,571,784
4,571,785
543 4,571,787
602 4,571,788
625 4,571,789

CLASS 27

10 4,571,790
19 4,571,791

CLASS 28

180 4,571,792
220 4,571,793

CLASS 29

25.35 4,571,794
26 B 4,571,795
27 R 4,571,796
33 K 4,571,797
121.8 4,571,798
149.5 A 4,571,799
157 C 4,571,800
157 R 4,571,801
157.3 R 4,571,802
235 4,571,803
4,571,804
243.56 4,571,805
251 4,571,806
252 4,571,807
268 4,571,808
270 4,571,809
412 4,571,810
436 4,571,811
445 4,571,812
568 4,571,813
571 4,571,814
4,571,815
4,571,816
576 B 4,571,817
576 W 4,571,818
4,571,819
723 4,571,820
727 4,571,821
736 4,571,822
749 4,571,823
764 4,571,824
823 4,571,825
840 4,571,826

CLASS 30

29.5 4,571,827
123.3 4,571,828
144 4,571,829
200 4,571,830
276 4,571,831
280 4,571,832
381 4,571,833

CLASS 33

1 PT 4,571,834
20.1 4,571,835
25 B 4,571,836
30.1 4,571,837
169 C 4,571,838
178 E 4,571,839
185 R 4,571,840
4,571,841
200 4,571,842
355 R 4,571,843
366 4,571,844
379 4,571,845
438 4,571,846
503 4,571,847
544 4,571,848

CLASS 34

79 4,571,849
242 4,571,850

CLASS 36

11.5 4,571,851
32 R 4,571,852
43 4,571,853
50 4,571,854
4,571,855
89 4,571,856
91 4,571,857
117 4,571,858

CLASS 37

191 A 4,571,859
197 4,571,860
241 4,571,861

CLASS 38

77.81 4,571,862
86 4,571,863
102.5 4,571,864

CLASS 40

10 R 4,571,865
152.1 4,571,866
405 4,571,867
590 4,571,868
605 4,571,869

CLASS 42

1 A 4,571,870
75 A 4,571,871
85 4,571,872
90 4,571,873

CLASS 43

4.5 4,571,874
11 4,571,875
17 4,571,876
42.11 4,571,877
43.11 4,571,878
44.97 4,571,879
122 4,571,880

CLASS 47

40.5 4,571,881
4,571,882
66 4,571,883

CLASS 49

72 4,571,884
177 4,571,885
374 4,571,886
429 4,571,887
450 4,571,888
482 4,571,889

CLASS 51

92 ND 4,571,890
165.87 4,571,891
309 4,572,722
325 4,571,892
397 4,571,893
426 4,571,894

CLASS 52

9 4,571,895
12 4,571,896
13 4,571,897
36 4,571,898
60 4,571,899
65 4,571,900
106 4,571,901
127.2 4,571,902
173 R 4,571,903
205 4,571,904
235 4,571,905
239 4,571,906
4,571,907
309.4 4,571,908
309.8 4,571,909
391 4,571,910
509 4,571,911
710 4,571,912
722 4,571,913
747 4,571,914
785 4,571,915

CLASS 53

48 4,571,916
148 4,571,917
149 4,571,918
266 R 4,571,919
300 4,571,920
373 4,571,921
397 4,571,922
398 4,571,923
453 4,571,924
502 4,571,925
525 4,571,926
547 4,571,927

CLASS 55

25 4,572,723
159 4,572,724
274 4,572,725
337 4,572,726
414 4,572,727

CLASS 57

22 4,571,928
4,571,929
274 4,571,930
281 4,571,931
401 4,571,932
4,571,933

CLASS 59

90 4,571,934

CLASS 60

39.05 4,571,935
39.31 4,571,936
39.75 4,571,937
303 4,571,938
372 4,571,939
444 4,571,940
466 4,571,941
547.1 4,571,942
560 4,571,943
562 4,571,944
602 4,571,945
618 4,571,946
641.8 4,571,947
4,571,948
655 4,571,949

CLASS 62

21 4,572,728
89 4,571,950
212 4,571,951
235.1 4,571,952
339 4,571,953
514 R 4,571,954

CLASS 65

18.1 4,572,729
67 4,572,730
99.5 4,572,731
271 4,572,732

CLASS 66

75.1 4,571,955
84 A 4,571,956
115 4,571,957
132 R 4,571,958
169 R 4,571,959
196 4,571,960
208 4,571,961

CLASS 68

5 E 4,571,962
171 4,571,963

CLASS 70

58 4,571,964
227 4,571,965
232 4,571,966
456 R 4,571,967

CLASS 71

64.08 4,572,733
72 4,572,734
88 Re.32,087

CLASS 72

56 4,571,969
68 4,571,970
90 4,571,971
98 4,571,972
137 4,571,973
217 4,571,974
325 4,571,975
331 4,571,968
342 4,571,977
349 4,571,978
350 4,571,979
381 4,571,980
391 4,571,976
400 4,571,981
4,571,982
462 4,571,983

CLASS 73

19 4,571,984
38 4,571,985
49.1 4,571,986
49.2 4,571,987
60 4,571,988
4,571,989
118 4,571,990
4,571,991
119 A 4,571,992
151 4,571,993
168 4,571,994
199 4,571,995
202 4,571,996
215 4,571,997
321 4,571,998
598 4,571,999
718 4,572,000
765 4,572,001
809 4,572,002
861.18 4,572,003
861.58 4,572,004
862.36 4,572,005
862.64 4,572,006
863.12 4,572,007
864.51 4,572,008
864.91 4,572,009

CLASS 74

2 4,572,010
3.5 4,572,011
41 4,572,012
50 4,572,013
89.15 4,572,014
191 4,572,015
200 4,572,016
394 4,572,017
397 4,572,018
471 XY 4,572,019
477 4,572,020
479 4,572,021
485 4,571,786
492 4,572,022
493 4,572,023
498 4,572,024
604 4,572,025
700 4,572,026
812 4,572,027
828 4,572,028
866 4,572,029
4,572,030
4,572,031

CLASS 75

10 R 4,572,735
4,572,736
53 4,572,737
128 Z 4,572,738

CLASS 76

101 B 4,572,032

CLASS 81

3.2 4,572,033
3.29 4,572,034
53.2 4,572,035
57.16 B1 4,445,402
57.2 4,572,036
126 4,572,037
439 4,572,038
451 4,572,039
463 4,572,040
477 4,572,041

CLASS 82

1 C 4,572,042

CLASS 83

18 4,572,043
42 4,572,044
97 4,572,045
171 4,572,046
481 4,572,047

CLASS 84

1.19 4,572,048
313 4,572,049
385 A 4,572,050
453 4,572,051

CLASS 86

48 4,572,052

CLASS 89

1.51 4,572,053

CLASS 91

1 4,572,054
369 A 4,572,055

CLASS 92

86 4,572,056
165 PR 4,572,057
187 4,572,058

CLASS 98

42.22 4,572,059

CLASS 99

280 4,572,060
331 4,572,061
345 4,572,062
524 4,572,063

CLASS 100

8 4,572,064
35 4,572,065
295 4,572,066

CLASS 101

7 4,572,067
35 4,572,068
76 4,572,069
93.05 4,572,070
183 4,572,071
348 4,572,072
350 4,572,073
426 4,572,074

CLASS 102

313 4,572,075
431 4,572,076
439 4,572,077
464 4,572,078

CLASS 104

7 B 4,572,079
252 4,572,080

CLASS 106

74 B1 3,837,872
101 4,572,739
122 4,572,740

CLASS 108

17 4,572,081

CLASS 110

215 4,572,083
235 B1 4,232,614
245 4,572,082
261 4,572,084
345 4,572,085
347 4,572,086

CLASS 111

56 4,572,087

CLASS 112

104 4,572,088
128 4,572,089
153 4,572,090
229 4,572,091
256 4,572,092
4,572,093
322 4,572,094
456 4,572,095

CLASS 114

88 4,572,096

CLASS 116

227 4,572,097

CLASS 118

33 4,572,098
68 4,572,099
303 4,572,100
500 4,572,101
689 4,572,102
697 4,572,103

CLASS 119

14.02 4,572,104
14.18 4,572,105
14.47 4,572,106
17 4,572,107
51 R 4,572,108
155 4,572,109

CLASS 122

7 R 4,572,110
17 4,572,111
451 R 4,572,112
504.2 4,572,113

CLASS 123

21 4,572,114
41.21 4,572,115
78 D 4,572,116
90.16 4,572,118
90.65 4,572,117
145 A 4,572,119
196 S 4,572,120
203 4,572,121
206 4,572,122
262 4,572,123
300 4,572,124
325 4,572,125
4,572,126
339 4,572,127
4,572,128
4,572,141
357 4,572,130
4,572,131
4,572,132
431 4,572,133
438 4,572,134
440 4,572,129
4,572,135
447 4,572,136
450 4,572,137
4,572,138
478 4,572,139
4,572,142
479 4,572,143
501 4,572,144
538 4,572,145
541 4,572,140
549 4,572,146
556 4,572,147
559 4,572,148
589 4,572,149
602 4,572,150
622 4,572,151

CLASS 124

69 4,572,152
88 4,572,153

CLASS 126

39 E 4,572,154
76 4,572,155
140 4,572,156
258 4,572,157
263 4,572,158
415 4,572,159
439 4,572,160
440 4,572,161

CLASS 127

2 4,572,741
46.2 4,572,742

CLASS 128

1 R 4,572,162
4 4,572,163
6 4,572,164
24.1 4,572,165
52 4,572,166
78 4,572,167
79 4,572,168
80 C 4,572,170
80 H 4,572,169
90 4,572,171
94 4,572,172
132 D 4,572,173
149 4,572,174
203.11 4,572,175
204.26 4,572,176
205.17 4,572,177
205.27 4,572,178
303 A 4,572,179
304 4,572,180
305 4,572,181
B1 4,319,576
325 4,572,182
4,572,183
328 4,572,184
340 4,572,185
341 4,572,186
355 4,572,187
380 4,572,188
395 4,572,189
399 4,572,190
419 D 4,572,191
419 PG 4,572,192
4,572,193
419 R 4,572,194
463 4,572,195
581 4,572,196
644 4,572,197
653 4,572,198
657 4,572,199
660 4,572,200
4,572,201
4,572,202
661 4,572,203
675 4,572,204
686 4,572,205
692 4,572,206
706 4,572,207
718 4,572,208
726 4,572,209
736 4,572,213
748 4,572,212
765 4,572,210
774 4,572,211
785 4,572,214

CLASS 130

27 R 4,572,215

CLASS 131

70 4,572,216
175 4,572,217
302 4,572,218
308 4,572,219

CLASS 132

7 4,572,220
33 R 4,572,221
76.4 4,572,222
84 R 4,572,223
88.5 4,572,224

CLASS 133

8 E 4,572,225

CLASS 134

3 4,572,743
7 4,572,744
10 4,572,745
4,572,746

CLASS 135

22 4,572,226
72 4,572,227

CLASS 137

15 4,572,228
99 4,572,229
240 4,572,230
246.15 4,572,231
268 4,572,235
360 4,572,232
364 4,572,236
375 4,572,233
487.5 4,572,237
489 4,572,234
625.3 4,572,238
625.47 4,572,239

CLASS 138

92 4,572,240

CLASS 139

52 4,572,241
91 4,572,242
97 4,572,243
103 4,572,244
291 C 4,572,245
435 4,572,246
455 4,572,247

CLASS 140

92.1 4,572,248
92.6 4,572,249
105 4,572,250

CLASS 141

1 4,572,251
90 4,572,252
95 4,572,253
98 4,572,254
217 4,572,255

CLASS 144

39 4,572,256
115 4,572,257
208 J 4,572,258
230 4,572,259

CLASS 148

3 4,572,747
12 F 4,572,748
16.5 4,572,749
31.55 4,572,750
35 4,572,751

CLASS 152

158 4,572,260
209 R 4,572,261
379.3 4,572,265
451 4,572,264
501 4,572,262
537 4,572,263

CLASS 156

64 4,572,752
73.1 4,572,753
89 4,572,754
166 4,572,755
203 4,572,756
252 4,572,757
256 4,572,758
345 4,572,759
468 4,572,760
511 4,572,761
556 4,572,762
624 4,572,763
630 4,572,764
643 4,572,765

CLASS 159

28 4,572,766

CLASS 160

92 4,572,266
176 R 4,572,267
201 4,572,268

CLASS 164

93 4,572,269
97 4,572,270
4,572,271
131 4,572,272
158 4,572,273
169 4,572,274
339 4,572,275
342 4,572,276
436 4,572,277
457 4,572,278
463 4,572,279
467 4,572,280

CLASS 165

1 4,572,281
54 4,572,282
61 4,572,283
95 4,572,284
104.28 4,572,285
104.29 4,572,286
118 4,572,287

CLASS 166

63 4,572,288
123 4,572,289
4,572,290
170 Re.32,085
173 4,572,291
250 4,572,293
273 4,572,294
274 4,572,292
295 4,572,295
303 4,572,296
307 4,572,297
379 4,572,298
385 4,572,299

CLASS 172

54.5 4,572,300
445.1 4,572,301
813 4,572,302

CLASS 173

39 4,572,303

CLASS 174

35 GC 4,572,921
36 4,572,922
48 4,572,923
52 FP 4,572,924
68.5 4,572,925
103 4,572,926

CLASS 175

5 4,572,304
325 4,572,305
371 4,572,306
410 4,572,307

CLASS 177

1 4,572,308
50 4,572,309

CLASS 179

16 AA 4,572,927
99 A 4,572,928

CLASS 180

6.24 4,572,310
6.48 4,572,311
69.21 4,572,312
78 4,572,313
79.1 4,572,314
134 4,572,315
143 4,572,316
227 4,572,317
248 4,572,318
273 4,572,319
289 4,572,320
297 4,572,321

CLASS 181

105 4,572,322
129 4,572,323
4,572,324
145 4,572,325
150 4,572,326
295 4,572,327

CLASS 182

1 4,572,328
9 4,572,329
206 4,572,330

CLASS 184

7.4 4,572,331
15.1 4,572,332

CLASS 185

40 R 4,572,333

CLASS 188

71.6 4,572,334
72.1 4,572,335
72.6 4,572,336
268 4,572,337

CLASS 191

29 R 4,572,929

CLASS 192

3.29 4,572,338
3.31 4,572,339
4 C 4,572,340
13 R 4,572,341
56 R 4,572,342
4,572,343
106.1 4,572,344
106.2 4,572,345
134 4,572,346

CLASS 194

205 4,572,347
248 4,572,348
318 4,572,349

CLASS 198

372 4,572,350
412 4,572,351
457 4,572,352
577 4,572,353
592 4,572,354
667 4,572,356
693 4,572,357
781 4,572,358
803.12 4,572,355
819 4,572,359

CLASS 200

5 R 4,572,930
11 DA 4,572,931
17 R 4,572,932
151 4,572,933
222 4,572,934

CLASS 202

170 4,572,767

CLASS 204

15 4,572,768
59 R 4,572,769
98 4,572,770
118 4,572,771
141.5 4,572,772
201 4,572,773
229 4,572,775
238 4,572,774
298 4,572,776

CLASS 206

0.5 4,572,360
45.14 4,572,362
45.19 4,572,361
63.3 4,572,363
287 4,572,364
306 4,572,365
4,572,366
328 4,572,367
4,572,368
387 4,572,369
398 4,572,370
443 4,572,371
511 4,572,372
515 4,572,373
518 4,572,374
524.1 4,572,375
538 4,572,376
610 4,572,377

CLASS 208

11 LE 4,572,777
89 4,572,778
111 4,572,779
161 4,572,780
309 4,572,781

CLASS 209

236 4,572,782
640 4,572,378

CLASS 210

109 4,572,783
133 4,572,784
181 4,572,785
188 4,572,786
512.2 4,572,787
670 4,572,788

CLASS 211

57.1 4,572,379
4,572,380
94 4,572,381
150 4,572,382

CLASS 212

264 4,572,383

CLASS 215

1 C 4,572,384
216 4,572,385
228 4,572,386
252 4,572,387
4,572,388
253 4,572,389

CLASS 217

106 4,572,390

CLASS 219

10.55 B 4,572,935
73.2 4,572,936
83 4,572,937
85 BM 4,572,938
85 M 4,572,939
86.25 4,572,940
121 LD 4,572,941
137.420 4,572,942
273 4,572,943
391 4,572,944

CLASS 220

3.9 4,572,391
4 R 4,572,392
86 R 4,572,394
203 4,572,395
4,572,396
270 4,572,393
4,572,397
271 4,572,398
307 4,572,399
323 4,572,400
335 4,572,401
465 4,572,402

CLASS 221

3 4,572,403
223 4,572,404

CLASS 222

14 4,572,405
39 4,572,406
83 4,572,407
153 4,572,408
391 4,572,409
402.11 4,572,410
469 4,572,411
527 4,572,412
528 4,572,413

CLASS 224

212 4,572,414
253 4,572,415
326 4,572,416

CLASS 226

20 4,572,417
74 4,572,418

CLASS 227

8 4,572,419
110 4,572,420

CLASS 228

19 Re.32,086
103 4,572,421

CLASS 229

7 R 4,572,422
28 R 4,572,423
39 R 4,572,424
4,572,425
48 SA 4,572,426

CLASS 235

144 SP 4,572,945
380 4,572,946

CLASS 236

3 4,572,427
44 A 4,572,428

CLASS 237

2 A 4,572,430
2 B 4,572,429

CLASS 238

283 4,572,431
327 R 4,572,432

CLASS 239

88 4,572,433
453 4,572,434
553.5 4,572,435
585 4,572,436
703 4,572,437
708 4,572,438

CLASS 241

1 4,572,439
23 4,572,440
34 4,572,441
37.5 4,572,445
117 4,572,442
166 4,572,443
168 4,572,444

CLASS 242

7.02 4,572,446
18 DD 4,572,449
35.5 A 4,572,447
56 R 4,572,450
4,572,451
56.2 4,572,452
72 R 4,572,453
84.1 R 4,572,455
84.5 A 4,572,448
84.52 B 4,572,454
107.4 A 4,572,457
107.4 D 4,572,456
131 4,572,458
150 R 4,572,459
195 4,572,460
198 4,572,461
199 4,572,462

CLASS 244

3.3 4,572,463

CLASS 248

1 4,572,464
27.1 4,572,465
73 4,572,466
257 4,572,467
394 4,572,468
430 4,572,469
551 4,572,470
560 4,572,471
605 4,572,472
624 4,572,473
639 4,572,474

CLASS 249

194 4,572,475

CLASS 250

201 4,572,476
211 J 4,572,947
227 4,572,948
4,572,949
4,572,950
231 SE 4,572,951
237 G 4,572,952
338 4,572,953
370 4,572,954
483.1 4,572,955
492.2 4,572,956
493.1 4,572,957
495.1 4,572,958
506.1 4,572,959
516.1 4,572,960

CLASS 251

285 4,572,477
305 4,572,478

CLASS 252

8.5 A 4,572,789
4,572,790
46.3 4,572,791
171 4,572,792
182.1 4,572,793
299.2 4,572,794
522 R 4,572,795
4,572,796
631 4,572,797

CLASS 254

2 R 4,572,479
93 R 4,572,480
106 4,572,481

CLASS 260

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